CHEMICAL MARKETS

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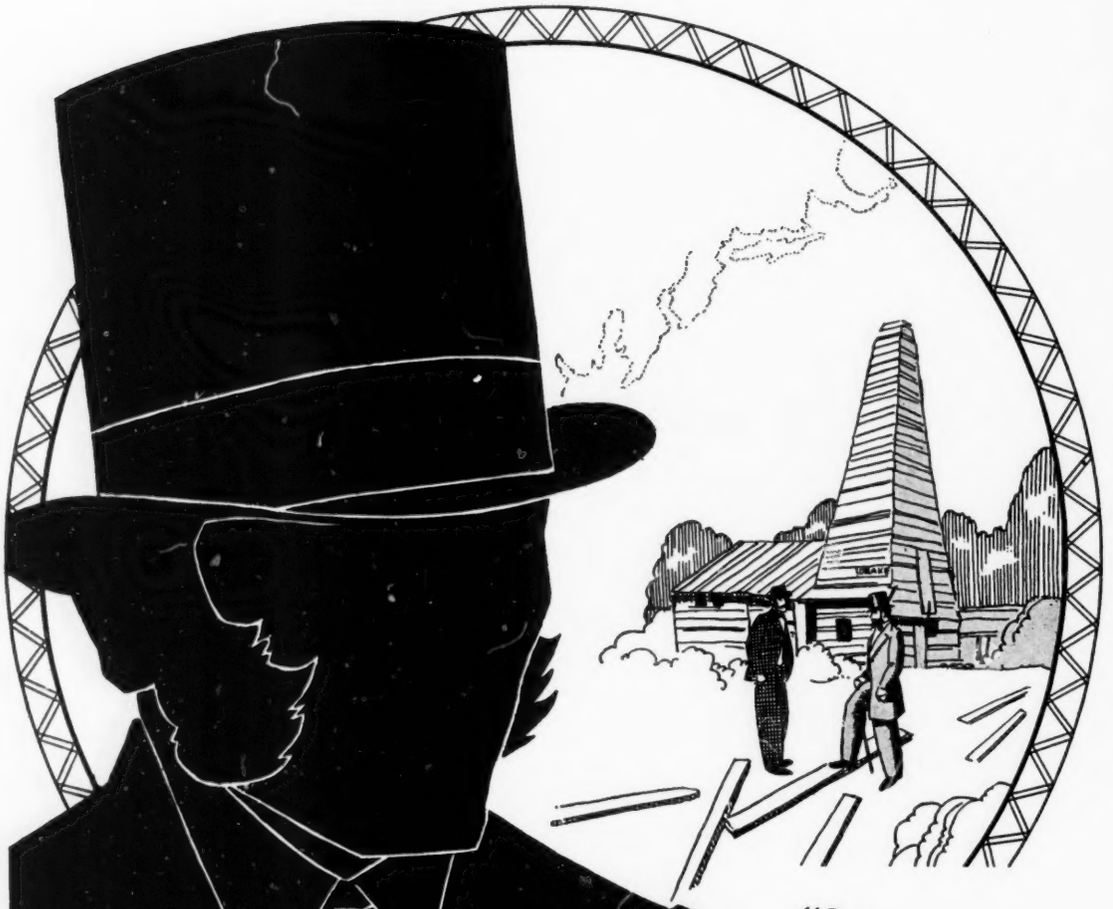
"Political Capital"

THE Senate is playing politics with the tariff. There is nothing novel in this; but it is being done under new conditions, conditions that are rather startlingly revealed in the spirited cross-questioning of witness at the tariff lobby investigations.

MR. GRUNDY—in spite of his unfortunate name and even more unfortunate manner—rouses the sympathy of many a sound industrialist when he complains that this representative government of ours is apt to be quite misrepresentative of industrial interests in matters of legislation that seriously effect American business. That Idaho, New Mexico, and Mississippi (to use his own example) should have equal voice with New York, Pennsylvania, and Ohio in industrial legislation is galling when Senators from the "backward states" (as he branded them) are the most active and noisy obstructionists. It is perfectly human that Mr. Grundy should point with scorn to the scanty populations of these states and draw invidious comparisons from their pitiful tax contributions to the support of the government. The Senators from these states are quite as human when they trim their togas with old political shillobeths about "the peepul versus the pedatory interests".

ALL this is very familiar. But a heat is generated at some of the tariff hearings which betrays a glowing resentment on the part of industry. One of the most important causes contributing to this increasing resentment is the preferred treatment given to agriculture. No sane industrial leader minimizes the importance of a successful, profitable farming industry to the economic health of the entire nation. But again it is a perfectly human reaction to contrast the frantic efforts of Congress to help the farmer—often with schemes that would not only be enormously costly but even seriously dangerous—with the bully-ragging antagonism displayed towards manufacturing industries just as important to our national prosperity.

THERE is some highly flammable political material here. If the Government largesse to agriculture in the form of subsidies and tariffs even begins to be an appreciable tax upon the bread baskets of city dwellers, then we shall see a new political line-up, a cleavage into urban and rural parties; an allignment as old as Rome and Egypt and one that is historically unsatisfactory; an allignment, moreover, that would find the chemical industry in a most embarrassing position. It is just possible that a well organized, "industrial bloc" would forestall these eventualities. Offense is the best defence, and it is increasingly plain that industrial interests need vigorous defence in Washington.



STREAMS of "Devil's Tar" often put the salt well drillers of seventy-five years ago to great expense. Then a man of larger vision, Colonel E. L. Drake, perceived the possibilities of this fluid and, in 1858, formed the first company to drill for petroleum. He "struck oil" on the banks of Duck Creek, Washington County, Ohio, where a monument now marks the spot. Drake's success was the beginning of an era of oil speculation and competitive drilling that has made possible the automobile, the air engine, the motorship, and the thousand and one applications of the by-products of petroleum.

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How it will Affect Business?

Such an erasure of securities' values as Wall Street made last month can not but affect the general business of the country, for all were not merely paper losses. Nevertheless its effects are apparently more personal than financial or industrial; and the results must be looked for through the actions of individuals.

It is not going to be easy to do business with the thousands of men who have "taken a beating". Their tempers will be short and their caution aroused. The sales of all luxuries will undoubtedly be curtailed—and the automobile, radio, jewelry, rayon and other industries will suffer. There are some big chemical consumers among them; but other basic industries—even larger chemical users —will doubtless profit. Real estate and building notably are expecting a favorable reaction.

It is noteworthy that there were no financial repercussions. Money for industrial purposes will be more plentiful and cheaper. Many big corporations are planning to declare extra dividends out of their vast surpluses; and there will be a concerted action on the part of financial interests to emphasize the fundamental fact that the country is sound and business conditions good.

Unenlightened Ignorance

Why the chemical industry of all the industries, persists in maintaining an unenlightened attitude regarding census figures is a peculiarity of no mean proportions. That an industry whose members depend for their very existence on keeping up with or a bit ahead of the march of progress, should, in this matter, dogmatically lag behind, is as puzzling as it is inconsistent. All sorts of explanations are offered, the best of which seems to be that it is a sort of psychological hangover from the influence of the European system of chemical secrets. But, whatever the reason, the fact remains that this foolish secrecy is fundamentally harmful and obviously not attuned to modern trends in business and industry.

In the first place, this secrecy makes it evident that those within the industry do not trust each other. This is not extremely serious inasmuch as it is an obstacle not too difficult to surmount. Each producer hesitates to send in entirely accurate figures of his own production because he is afraid that his competitors will not send in accurate figures on theirs. Each producer is certain that he knows total production and production of each of his competitors, but he does not credit them with having the same knowledge. Having this knowledge, he figures that he has the inside track and does not want to contribute towards figures which may aid his competitor in knowing as much as he thinks he does. As a matter of fact, most of their ideas concerning production coincide curiously, so that this advantage is imaginary, rather than real. Hence it seems logical to assume that this difficulty of distrust might easily be overcome, since it merely consists in granting that a competitor may be just as shrewd a guesser as oneself.

The other, a much more serious difficulty in the way of securing accurate chemical statistics, lies in the fact that producers of chemicals do not trust the government. Everybody grants that census figures should be inviolate. Yet, was it not generally understood that income tax figures should be inviolate ? Despite this, the Senate secured full access to them on the grounds that the material was necessary for the tariff debate. What assurance is there, reasons the producer of chemcals, that my production figures may not be made available to my competitors, on some such flimsy excuse. The manufacturer is justified, in the light of past experience, in this suspicion. A way out of this difficulty may lie in some system of keying the reports, so that, while concealing the source and the individual figures, a correct total might be reached.

The chemical industry is beginning to realize that it is backward in not having more accurate statistics. Accurate production figures would have been especially valuable in many instances in the recent tariff hearings. Adequate consumption figures prove especially valuable to new mergers or companies contemplating mergers. And there is always the fundamentally sound proposition that statistics would help the chemical industry adjust supply to demand. The other major industries have production figures available to the last jot and tittle, and yet they seem to prosper. Within the chemical industry, coal tar dyes and alcohol figures are public property, and everybody seems quite glad of it. Why, in this matter, is the chemical industry content to remain unenlightened ?

"It's an Ill Wind . . . ."

The struggle for control of the mercury market is proving just such a long drawn out struggle as was to be expected from the strength of the contestants. Over a year has passed since the formation of the Italo-Spanish producers' combine with no evidence

of weakness on either side. The English brokers as yet show no sign of the strain of maintaining stocks in the face of this opposition. Doubtless their stocks are depleting, but probably not so rapidly as might have been expected.

High prices have had the double influence of curtailing consumption and of bringing production from other sources into the market. Of course, supplies from this outside competition are as nothing compared to the resources of the combine, but in conjunction with curtailed demand, they have doubtless prevented the brokers' stocks from any noticeable depletion. Judging from reports from abroad, the policy of the combine now is to force steadily rising prices. Conditions in this market have reached such a stalemate, that it would occasion but little surprise if prices were to remain at quoted levels.

Meantime, "it's an ill wind that blows nobody good", for American mercury production has been stimulated so that during the past year it has supplied over fifty per cent of the domestic requirements. There is no indication of lower prices in the near future so that domestic producers will be encouraged to step up production to an even greater extent during the coming year.

Quotation Marks

Individual British concerns such as Imperial Chemical Industries, Ltd., have been taking vigorous steps to further their industrial and commercial progress in South America and the advantageous position which the United States acquired through the opportunity of the war years has been steadily growing less formidable from the viewpoint of competing countries. To-day, as before the war, British goods still stand foremost for quality and reliability in the eyes of South American buyers; the British Empire is the largest outlet for South American exports; and British money is still the predominating factor in the development of the transport and productive facilities of the sub-continent. Altogether, the time seems opportune for a systematic and well-planned attack by British exporters upon the markets of South America.—*Chemical Trade Journal.*

A patent, once granted, should confer not only a monopoly but the right to exercise that monopoly within the limits of the patent granted. The time to determine the state of common knowledge is before the grant of a patent, not years later; the place the Patent Office, not the law courts.—*Dr. Herbert Levinstein.*

It is difficult to give a simple and at the same time comprehensive definition of rationalization, but it may be described as the technical, commercial, and financial organization of an industry in such a manner that the cost of manufacture of the products of the industry can be reduced to the lowest possible level without adversely affecting the conditions of employment of those in the industry. To put it in other words, it is the employment of all methods of technique and organization in order to increase the productivity of the workers to the highest possible degree, and as a result to improve, increase, and cheapen production.—*J. Davidson Pratt.*

The chemist's broad knowledge of industrial processes and the possibilities of the application of chemistry to the problem of earning dividends would certainly be a valuable contribution to the successful administration of many an industrial business.—*Business Chemistry.*

The official statistics of the Treasury Department based upon the sworn returns of corporations show that, as a whole, the chemical industry is the most prosperous of all lines of American production.—*Senator LaFollette.*

Nature is constantly confronting her creatures with this imperious dilemma; to achieve adaptation or to disappear.—*Le Bon.*

Ten Years Ago

(From our issues of November 1929)

Hellenic Color & Chemical Co., Inc., New York, filed petition in bankruptcy.

Charles H. MacDowell, president, Armour Fertilizer Works, was elected a member of the French Legion of Honor.

Newport Chemical Works, Inc., increases capital from $25,000 to $250,000.

Secretary of War Baker proposed an additional appropriation of $12,000,000 to enlarge the Muscle Shoals nitrate plant.

Pfaudler Co. recovered plant in Germany which had been seized during the war.

Union Dye & Chemical Co., American Aniline Products, Inc., Rollin Chemical Co., and Clinchfield Chemical Co. were rumored to be planning a $15,000,000 merger with B. R. Armour, president of the American Aniline Products, at the head.

German production and sale of potash was brought under control of the government.

Armour & Co. constructed a new fertilizer plant at Curtis Bay, Md., at cost of $1,500,000.

Victor Chemical Works purchased 22-acre site at Nashville, Tenn., upon which to erect a plant to be operated in connection with the company's phosphate rock developments. Project is estimated to cost more than $500,000.

Modern Trends in ALKALI DISTRIBUTION

By E. E. Routh

Manager of Sales, The Mathieson Alkali Works, (Inc.)

ALKALI, in one form or another, to-day enters into the activities of practically every one of our major industries. So varied and essential are its uses that the tonnage consumed, and the tonnage of soda ash in particular, is now regarded by many as a valuable index of general industrial activity.

The term alkali is usually understood to refer to the two most important commercial alkalies—soda ash and caustic soda. Of these two, soda ash is of greater industrial importance, being second only to sulfuric acid, in tonnage consumed, among all the manufactured chemical raw materials. In money value, moreover, soda ash outranks even sulfuric acid.

Ten Years Changes

The distribution of alkali, together with that of many other chemicals, has undergone important changes in the past ten years. Prior to the world war the entire production of alkali in the United States was sold through middlemen known as exclusive selling agents, the producers being solely manufacturing organizations with no direct contact with the consuming industries. During the war, producers were brought into closer contact with consumers, with the result that a movement toward elimination of the middleman was set in motion. One by one progressive manufacturers adopted the policy of selling direct to the consumer, until to-day all alkali producers are marketing their products direct.

This new set-up in chemical distribution has created an entirely new type of selling organization, with specialized technical knowledge of the products sold and of their various applications in the consuming industries. Experienced chemical engineers have been added to the selling staff and technical service has become an important factor in the merchandising of alkali and other chemicals. Less-carload distribution has been placed on an efficient basis, with conveniently located warehouse stocks for shipments to smaller consumers and for emergency service to carload buyers. Branch sales offices have been established in the principal consuming territories to provide more intimate contact with the buyer and his production problems.

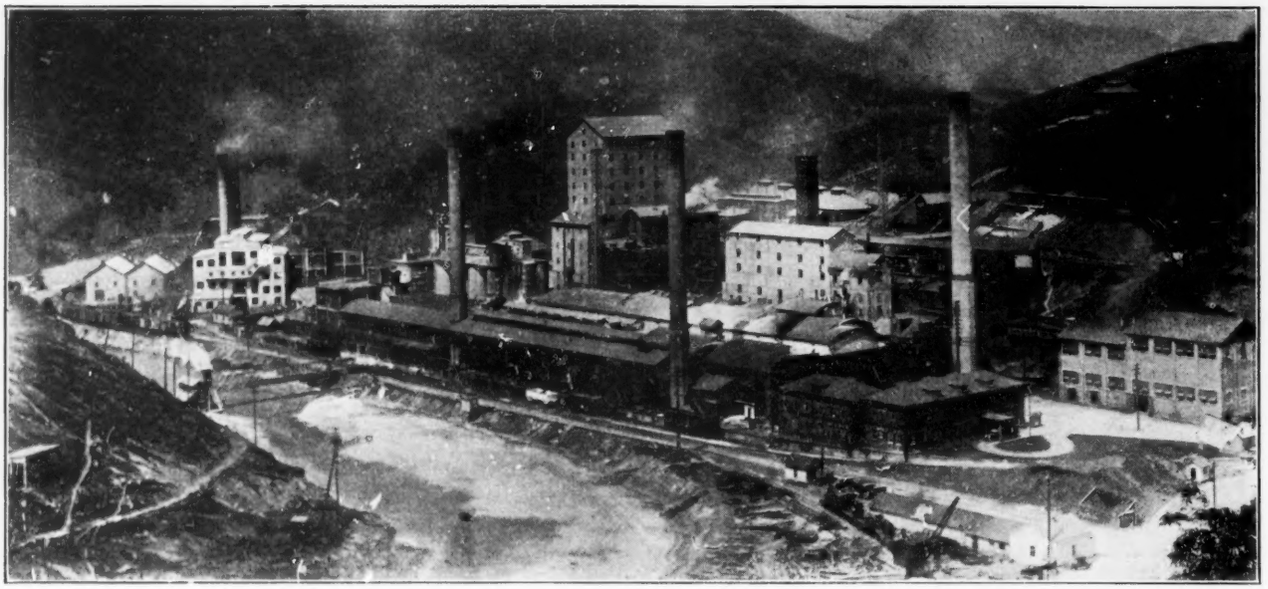
Traffic Service Proves Valuable

Another important technical service which has proven itself of direct monetary benefit to alkali consumers is the modern traffic department. It was early recognized that a competent traffic department, for the purpose of protecting consumers' interest in connection with freight rates on their alkalies, became increasingly important as the principle of direct dealing with consumers was more firmly established.

Results have proven the worth of such traffic service. In the tremendous readjustment of the freight rate structure of this country since the war, the traffic advisors of the alkali industry have been an important factor. Moreover, their efforts are responsible for the constant adjustments of alkali freight rates since the war, and their existence is a guarantee of continued protection to the consuming industries.

The traffic department of to-day also is charged with insuring fast and dependable service in the delivery of alkalies to the consumer. Only by the closest co-operation between industry and the railroads has the unsatisfactory service of some years ago been transformed into what it is to-day, namely—the most efficient service the country has ever known. With this responsibility of the traffic department is coupled the duty of efficiently managing the tremendous fleet of cars now owned and operated by the alkali industry for the benefit of consumers.

Out of the closer relationship which has been established between buyer and seller some changes of great economic importance have come. Foremost among



View of the Saltville, Va., plant of The Mathieson Alkali Works (Inc.) located at one of the most extensive deposits of salt in the South.

these should be mentioned the distribution of caustic soda in liquid form, which is the most interesting of all recent developments in the alkali industry. It is a development of interest primarily to the larger consumer who is able to take shipments of caustic soda in a concentrated water solution in tank car quantities.

Caustic soda consumption has shown a substantial increase in recent years, part of this increased tonnage being the normal result of greater industrial activity and part being due to new uses which have developed. One important factor, for example, has been the rapid growth of the rayon industry, which alone consumes in the neighborhood of one hundred thousand tons of caustic soda per year. The manufacture of rayon also demands a caustic soda of high purity, particularly with respect to iron, and producers have installed evaporators and other costly special equipment in order to satisfy these purity requirements.

Two Manufacturing Processes

In the manufacture of caustic soda, two different methods are used, the electrolytic process and the ammonia-soda process, with common salt as the basic raw material in each case. The electrolytic process consists in separating a salt solution into its component elements sodium and chlorine by means of a high-potential electric current. The sodium thus liberated reacts at once with water to form a solution of sodium hydroxide or caustic soda. In the ammonia-soda process a salt solution is saturated with carbon dioxide gas and ammonia, with the resulting formation of ammonium bicarbonate which immediately reacts to precipitate sodium bicarbonate. By heating the bicarbonate in rotary furnaces soda ash is obtained and causitc soda is made by treating soda ash solution at boiling temperature with lime.

The larger part of the increased production of caustic has been in that made by the ammonia-soda process. Electrolytic production of caustic soda necessarily means the production of chlorine in the same operation, and while many heavy consumers of caustic soda are also consumers of liquid chlorine, consumption of the latter has not kept pace with that of caustic.

The result of this situation has been an over-production of chlorine and a corresponding decline in the price of this commodity. It is unlikely therefore that for sometime to come there will be a further increase in production on the part of the electrolytic manufacturers, for without a satisfactory outlet for chlorine, caustic cannot be manufactured by the electrolytic process to profitably compete with the ammonia-soda producers.

Future Sale by NaOH Content

Nearly all standard brands of caustic soda, with some special exceptions, are now offered on the basis of 76 per cent sodium oxide by actual test; in other words, the old "N. Y. & L." test, which survived for so many years, has practically disappeared from the market. Moreover, there has been for some years a consistent effort on the part of progressive alkali producers to market caustic soda on the basis of its sodium hydroxide content rather than on the basis of the sodium oxide equivalent. Eventually it may be possible to drop the antiquated "76 per cent Na_2O" and sell caustic as 98 per cent or 99 per cent NaOH, according to what its actual hydroxide content may be.

Another positive trend in distribution is the replacement of ground caustic by flake caustic. The latter is a development of comparatively recent years and has proven so much more satisfactory to consumers that there is now little demand for the ground form. It is probable that flake caustic, having more ready solubility and less tendency to dust or to cake in the drum, will eventually take over all the ground caustic market.

The value of close contact with the consumer's problems is also well illustrated in the case of soda ash, which is now offered in three different forms in accordance with industrial requirements—light, dense and fused. While the difference between these three products is one of physical form only, it is of considerable importance to the consumer. Glassmakers, for example, who are large consumers, require a dense, granular product which will mix uniformly with the other ingredients of their batches and consume the minimum amount of heat in fusing. Being one of their major raw materials, soda ash is delivered in bulk carloads and a dusty product therefore creates a difficult handling problem. Much progress has been made in recent years in providing a dense, granular product that more nearly meets all these requirements of the glass maker.

Uses of Fused Soda Ash

Soda ash in fused brick form is a comparatively recent development and is finding favor in the iron and steel industry as a more active cupola flux and as a refining and desulphurizing agent for the molten metal. Its action is similar to that of limestone, the time-honored metal flux, its greater activity being due to its lower melting-point and more strongly basic character. In most cases it is preferred over ordinary powdered soda ash owing to the fact that it is entirely free from moisture and is more conveniently handled in metallurgical operations. Fused soda ash is also being used for certain types of water treatment where convenient form and a slow dissolving-rate are desired.

Light soda ash is the form usually shipped to the other principal consumers-manufacturers of chemicals, soap, cleansing compounds, pulp and paper, rayon and textiles, petroleum products, dyes and coal-tar products, paint and varnish, leather, etc. A considerable tonnage also goes into water-softening operations, exports and miscellaneous uses.

Soda ash, mixed in varying proportions with either caustic soda or bicarbonate of soda, is a constituent of a great many alkali mixtures marketed under trade names for a variety of special purposes. While these special alkali mixtures may do all that is claimed for them, the average consumer now has a better knowledge of chemicals and their application and no longer accepts a product without question simply because the supplier has labeled it as designed for that particular consumer's purposes. Often he has found that either straight 58 per cent soda ash or 76 per cent caustic soda alone will do the same job at a worthwhile saving both in cost and in the quantity of material required.

This trend toward the use of straight alkalies is marked among the more progressive consumers and those whose alkali requirements are large enough so that they are interested in the improvements and economies involved. It is an interesting trend in that it shows an increasing disposition on the part of the smaller user to apply the same discrimination in buying his chemicals that the carload buyer has long exercised.

Another recent development in alkali distribution is the offering of light soda ash in one hundred pound double paper bags for the convenience of consumers. It has been found that a good quality of Kraft paper bag gives satisfactory protection to the product and eliminates the consumers' problem of salvaging burlap bags. The one hundred pound bag is also more convenient to handle and offers an accurate unit of measure in connection with various processing operations. It is probable that a substantial tonnage of soda ash will move in this new package when consumers fully appreciate its advantages.

The Alkali Price Trend

Considering the tremendous improvement in the quality of both ash and caustic—and particularly the latter—together with better shipping and distributing service, the average consumer can figure that his alkali is costing him very little if any more than it did prior to the war. The manufacturers are necessarily operating at a small margin of profit, but this is offset in a measure by their being able to run their plants at maximum capacity, and as long as general industrial conditions continue as at present, it is probable that alkali prices will remain staple at around prevailing levels with a possible advance in caustic.

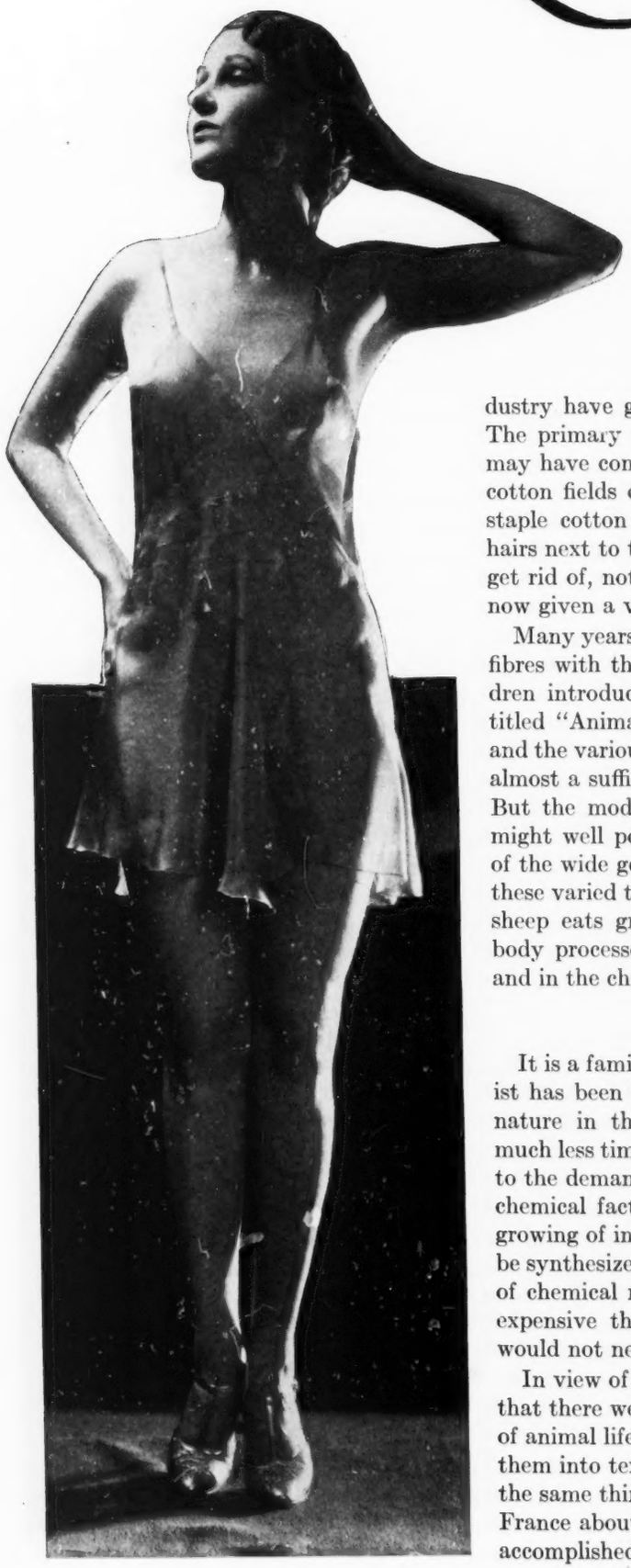
World's Superphosphate Output Estimated at 14 Million Tons

World's superphosphate output in 1927 is estimated at 13,738,330 metric tons. The largest individual producer in that year was the United States with 3,144,973 tons. England came next with 2,215,000 tons and Italy third with 1,370,000 tons It is interesting to note says "The Chemical Trade Journal," London, that the recovery to the pre war- world output of eleven million tons was not accomplished till 1923 and that the jump to nearly fourteen million tons that took place in 1925 has been maintained since. One of the main features brought out by this analysis of the statistical position is the amount of phosphate rock used for purposes other than superphosphate manufacture. The use of ground phosphate rock directly as a fertilizer has been gaining ground for some time, largely due to the pioneering work of the late Mr. G. D. Macindoe in New Zealand, while steel manufacturers in some countries are using large quantities of phosphate rock for enriching the phosphate content of basic slag. It is estimated by Mr. Gray that approximately one-fifth of the phosphate rock used in 1927 was employed for this and other purposes, which latter we should imagine will include the direct conversion of phosphate rock into phosphoric acid by the modern pyrolytic processes as used in Germany and the United States. With the growth of the use of ammonium phosphate and similar concentrated phosphoric acid fertilizers, some element of danger to the existing superphosphate industry exists, but this industry is of such magnitude and so widely scattered throughout the world that it will probably be long enough before any considerable influence on its total tonnage output will be felt.

CHEMICAL

By Gustavus J. Esselen, Jr.

Vice-President and Director of Research, Skinner, Sherman & Esselen, Inc.



WHEN we happen to see an attractive dress made of rayon we are usually too much fascinated by its beauty or by the charm of the lady who wears it, to be for the moment interested in the varied chemical and other industries which have contributed to its production. The fact remains, however, that the requirements of the rayon industry have greatly increased the demand for many chemicals. The primary raw material is of course the cellulose base which may have come from the spruce forests of the north or from the cotton fields of the south. In the latter case it is not the long staple cotton which is used, but rather the linters—the short hairs next to the hull of the cottonseed which were a nuisance to get rid of, not so many years ago, yet to which the chemist has now given a value of over eight cents a pound.

Many years ago, before most people had even heard of artificial fibres with the appearance and feel of silk, a magazine for children introduced a cut-out feature for its youthful readers entitled "Animals We Wear." There were sheep and silk worms and the various fur-bearing animals, and the camel and the llama, almost a sufficient variety in kind and habitat to stock a circus. But the modern child, sophisticated in biology and chemistry, might well point out, perhaps with added interest, that in spite of the wide geographical differences, the ultimate source of all of these varied textile fibres was the same, namely, vegetation. The sheep eats grass and this is converted by wonderfully intricate body processes into wool. The silk worm eats mulberry leaves and in the chemical laboratory of its small body these become silk.

Duplicating Nature's Products

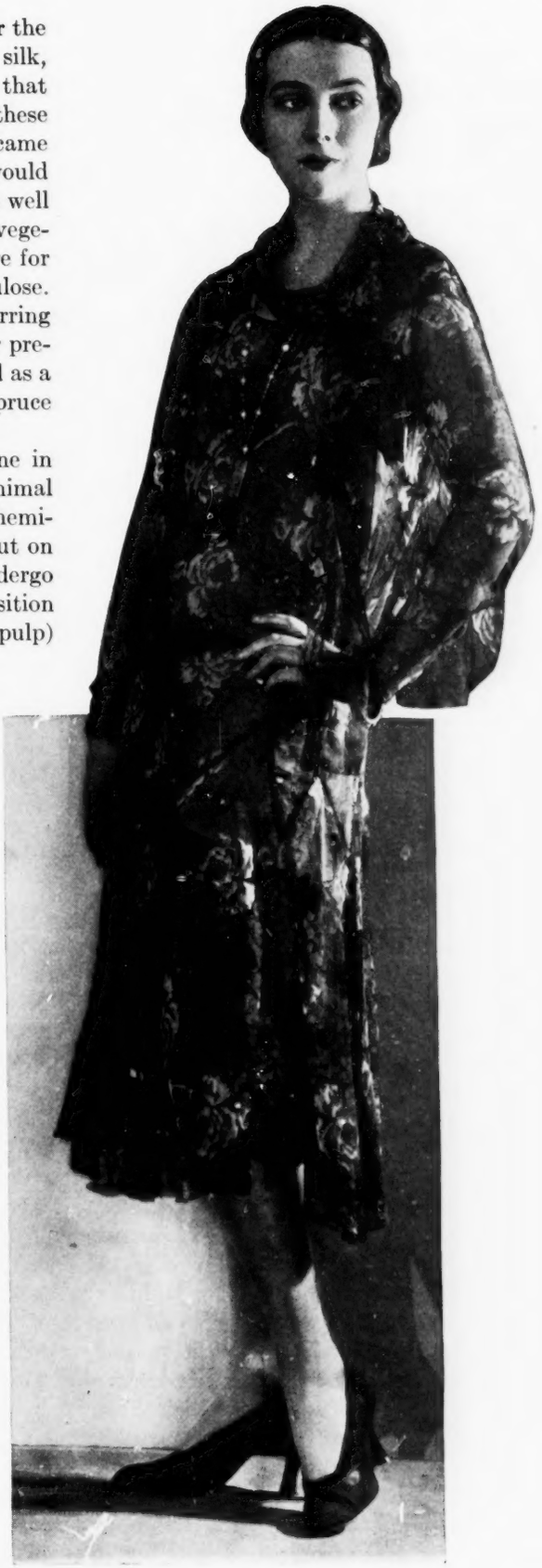
It is a familiar fact that in the last seventy-five years the chemist has been finding ways to duplicate many of the products of nature in the laboratory and factory. These processes take much less time and the output can be much better accommodated to the demand. Alizarine, for example, now comes mainly from chemical factories rather than from the madder plant, and the growing of indigo is practically a thing of the past because it can be synthesized so cheaply. If vanillin could not be made by a series of chemical reactions, our vanilla flavorings would be far more expensive than they are because the supply of vanilla beans would not nearly meet the demand.

In view of these and many other examples it is not surprising that there were men who said to themselves that if various forms of animal life could take the products of vegetation and convert them into textile fibres, it should be possible to find a way to do the same thing in the laboratory and later, the factory. It was in France about forty-five years ago that this was first successfully accomplished and it was not many years more before four dis-

tinct methods of producing similar textile fibres artificially had been worked out.

In pioneering work of this sort, it is only human to aim for the most attractive goal in sight. In this case it was obviously silk, and since the silk worm seemed to be under the impression that mulberry leaves were the only proper raw material for silk, these were used as the basis of the early experiments. It soon became apparent, however, that no great manufacturing industry would be possible if it were dependent on mulberry leaves. It was well known that the material which forms the back bone of all vegetable matter was cellulose, and it was only natural therefore for the chemist to turn to other more available forms of cellulose. At first, use was made of cotton, the purest naturally occurring form of cellulose, but now methods have been developed for preparing wood pulp in a form just as satisfactory as cotton and as a result a large part of our rayon to-day comes from the spruce forests and might almost be referred to as wooden wear.

In this connection, however, it should be carefully borne in mind that when vegetable material is converted in an animal organism into silk or wool, the resulting fibre is in no way chemically related to the cellulose upon which the animal fed; but on the other hand, the rayon fibres produced by the chemist undergo no such complex transformation and have a chemical composition quite similar to that of the cellulose (be it cotton or wood pulp) from which they are made.



Four Rayon Processes

To-day there are four distinct processes for the manufacture of rayon. Of these, the so-called viscose process accounts for between 80 and 85 per cent of the total production. This starts with either wood pulp or cotton linters and after thoroughly saturating it with a solution of caustic soda of about 18 per cent strength, the excess is squeezed out in large hydraulic presses and the wet pulp which is left is mechanically opened up to a fine fluffy form known as "crumbs." Before these can be used, they have to be aged for two or three days, and if a uniform rayon is to be secured at the end of the process, this ageing operation has to be carried out under very strictly controlled temperature conditions, maintained by carefully adjusted automatic devices. The next step is to treat the crumbs with the carbon bisulfide, which changes them from white to a deep orange color and at the same time renders them soluble in dilute caustic soda solution. The resulting solution is not unlike refined molasses in appearance and consistency and this too has to be ripened at a definite and non-varying temperature. While this is going on, the liquid is filtered several times to remove all traces of dirt and undissolved material, and finally, after laboratory tests have indicated that the proper point has been reached, the solution is pumped to long rows of spinnerettes through each of which it is forced at a carefully regulated, uniform rate. These spinnerettes are about the size of the upper half of a lady's thimble, and in the end, which is flat, they have from 20 to 60 minute orifices through which

the cellulose solution is extruded into a precipitating or hardening bath. The tiny streams of liquid quickly coagulate in contact with this bath and before they leave it are sufficiently firm and strony to withstand handling, even though the individual filaments may be considerably less than one ten thousandth of an inch in diameter. After washing, purifying, bleaching and grading, they are ready for the textile mill.

Common Step in Processes

Although the other rayon processes all depend on different chemical reactions, they all have this in common, that the cellulose is first converted into liquid form, and then extruded through fine orifices into a hardening medium which in the Chardonnet (Tubize) and cellulose acetate (Celanese, Acele, etc.) processes is air, while in the cuprammonium (Bemberg) process it is a liquid precipitating bath.

Gustavus J. Esselen, Jr.

Like so many modern industries, the rayon industry gathers its raw materials from widely separated localities. Mention has already been made of the spruce forests of the north and the cotton fields of the south. From the shores of the Gulf of Mexico comes sulfur, altogether about 73,000 tons annually, used partly in the chemical conversion of the wood into pulp; partly in the manufacture of carbon bisulfide of which about 20,000 tons were required for the 80,000,000 pounds of viscose rayon produced in this country last year; and partly for the production of sulfuric acid of which about 75,000 tons was used in the bath which coagulates or hardens the cellulose liquid into fibre form.

Salt a Raw Material

Common salt is another natural raw material on which the viscose rayon industry is largely dependent. About 122,000 tons of salt were required in 1928 to produce the 68,000 tons of caustic soda required by the viscose rayon industry in this country. This presumably was made electrolytically and at the same time there was formed about 61,000 tons of chlorine but of this only about 2,000-2,500 tons were required to bleach the wood pulp used as raw material, leaving at least 58,500 tons to find a market elsewhere.

There is another raw material which is of particular significance for the rayon industry and this is an adequate supply of pure water. Persons outside of the rayon industry would have difficulty in appreciating fully the vital importance of this matter of water supply. It is of course obvious that the water must be free of any form of dirt in suspension, but it is equally true that the water must be free from harmful soluble salts, particularly iron compounds. If we assume that all of the rayon made in the United States last year was made from wood pulp and then figure the amount of water used in the manufacture of this pulp and its conversion into rayon, we find that about one hundred million gallons was the daily requirement. Some idea of what this really means may be had when it is realized that this is about the daily consumption of a large city like Boston or Cleveland.

Making the Rayon Dress

If these figures which describe the amounts of materials entering into the rayon industry are sufficiently large to be properly referred to as sublime, then it may not be inappropriate to speak of the amount of rayon which goes to make up some of the typical rayon garments as ridiculous. Consider, for example, the apparel of the young lady shown in the illustration. Seven yards of rayon voile were used in making her attractive dress, yet this whole seven yards weighs only 273 grams or six-tenths of a pound. This means that if the 96,000,000 pounds of rayon produced in this country last year had all been converted into similar dresses there would have been three dresses for every woman and girl in the United States. But perhaps such figures are dangerous. Hardly had we made this calculation when we discovered that the material of this dress is so sheer that it is desirable to wear a slip under it. "Slip" in this case must be used in the same sense as in the expression "a mere slip of a girl" —meaning a small girl—because it requires only two yards of fabric (about enough to make a shirt for a man) and weighs only three ounces, or less than two-tenths of a pound.

Making the Other Garments

When the scientific investigation covered by this paper had reached this point, the author felt that it would probably be the part of wisdom to stop, but not so the editor. He produced photographic evidence indicating that there were other garments not ordinarily visible, but which none the less were essential to milady's wardrobe. The one chosen for the second illustration weighs four-tenths of a pound. Or take the stockings; these weigh only 20 grams or about three-quarters of an ounce and they are thirty inches long at that. No wonder ladies have a light step!

Now let us sum up and see how much rayon is required to clothe the modern lady.

Dress	0.6 lb.
Slip	0.2 "
Stockings	0.05 "
Lingerie	0.4 "
	1.25 lb.

Of course no lady of to-day could get along on one such outfit, but even four of them would weigh only

five pounds. It is not surprising that the manufacturers of luggage are feeling this competition !

Again no lady would want all of her clothes the same color and so we call on the dye manufacturer and we find that one-twentieth of an ounce of dye is the total required for the outfit listed above, yet this small amount provides the infinite variety of shade and pattern which prevails in women's clothes. On the other hand, this means 250,000 pounds of dyes merely to dye the rayon produced in the United States last year.

Contribution of the Rayon Industry

Of course one could figure out the value in dollars of all of the raw materials used by the rayon industry, and this would doubtless result in very respectable figures which this industry contributes to the business of this country. The real contribution, however, of the rayon industry to the business of our nation is rather the fact that it can take materials costing in the neighborhood of twenty-five cents or thirty cents and convert them into a product which can be sold for more than four times as much. The labor required to do this receives almost twice as much in wages as the value of the raw materials and the amount paid to the administrative and technical staffs is about one-fifth as much as that paid for labor. The rayon industry is truly a new industry, producing new fibres which are in great demand and producing them under conditions free from the vagaries of nature. This has resulted in unusual price stability particularly when compared with the natural textile fibres. To be sure the present year has seen a marked downward trend in rayon prices due to increasing competition from both foreign and domestic sources but there are no seasonal ups and downs dependent on crop yields.

Stimulating Other Industries

The textile industry has again had a marked stimulative effect on the chemical industry, just as the increasing manufacture of cotton goods a century ago stimulated the Le Blanc soda process. The stimulus has not stopped here, however, but has extended to the older branches of the textile industry and to the whole apparel trade. Rayon is now used not only by itself but in conjunction with cotton to produce fabrics with a greater appeal to the eye; in combination with silk to give new effects not possible with silk alone and also for pleasing fabrics at a lower price; and with wool to give valuable new cloths which add variety to the feminine wardrobe.

In this connection it is interesting to note that although "only 2 per cent of high grade dress goods manufacturers were using rayon in 1926, at the close of 1927 more than 34 per cent were making use of it." A similar trend is being followed in ladies' underwear; the sales of rayon underwear have been increasing quite rapidly while those of cotton underwear have been falling off and those of silk have remained about the same. Recent figures show that 57 per cent in value of women's underwear is knit goods and of this 57 per cent almost half is made of rayon, a little less than a third is made of cotton and somewhat over one-fifth is silk. Men, too, use considerable quantities in shirtings, neckwear, and underwear.

The First Man-Made Fabric

To-day, the rayon industry is accepted at its face value as one which has developed the first man-made fibre and has carved out for itself a place in the industrial life of the world. In fact, the giant strides made each year by this youthful business—still in its teens in this country—have ceased to be the cause for remark; they seem to be taken for granted. What other industry can show a one hundred fold increase in sixteen years ? Certainly not many ! Yet the production of rayon in the United States in 1928 was very close to one hundred times the amount made here in 1912, the first year of the industry in this country. And the end is not in sight. Right now we seem to be at the beginning of a new epoch in rayon history. All the manufacturers are gradually increasing the strength and washability of their fibres and one manufacturer announced not long since a rayon fibre stronger even than silk. The limited quantities of this now available are already finding use in the production of sewing silk and the possibilities for general uses in the textile industry when the production becomes larger are a challenge to the imagination.

United States Arsenic Output Amounts to 14 Thousand Tons

Production of arsenic (arsenious oxide) in the United States in 1928 amounted to 14,163 short tons, of which 9,276 tons were refined and 4,887 tons were crude. Nearly all of the output was a by-product from smelting copper and lead ores; some was derived from arsenical gold ore. The products for the market consisted of refined white arsenic, crude white arsenic, "flue" dust and "treater" dust.

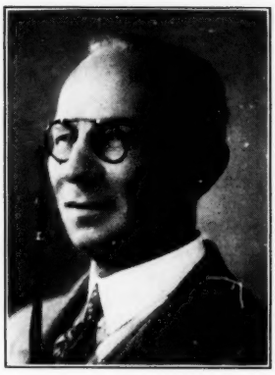
Of the refined and crude arsenic produced 11,767 tons were sold; it were valued at $735,373 or 3.125 cents a pound. The refined white arsenic, 8.115 tons, were sold for $537,950 or 3.315 cents a pound; the crude arsenic, 3,652 tons, was sold for $197,423 or 2.703 cents a pound.

Imports of crude and refined arsenic during 1928 amounted to 11,153 short tons. As the sales of domestic arsenic amounted to 11,767 tons, the total new supply on the market in the United States was 22,920 tons; this, with the 2,396 tons produced in 1928, but not sold, indicates 25,316 tons as the total new supply of white arsenic available.

Large-scale production of phosphorous is expected to reach 100 tons daily at the Piesteritz cyanamide works, Germany, where three giant closed three-phase furnaces are used, according to a report in "The Chemical Age." The crushed rock mixed with quartz and coal are fused, and the volatilized phosphorus converted into acid. The power consumption has been reduced from 11-13 kilowatt-hours to 9 kilowatt-hours per kilo of phosphorus. German phosphorus production (estimated by Dr. Johannes Hess, Munich) is 30,000 metric tons, compared to world production estimates by the same authority, of 33,000 metric tons.

MARKET ANALYSIS---

Modern Link Between Production and Sales



By Thomas K. Urdahl

IF THE market is depressed, many manufacturers find it necessary to employ more efficient selling methods than in former days when they relied almost exclusively on the reports of their sales force. Many small concerns still believe that market analysis and sales research is a new fangled invention which is often applied by large concerns but of no particular value to the smaller individual firms.

They are especially afraid of the word research. It conveys to their minds the idea of pure theory evolved by a closet philosopher and rather far removed from actual business practice. Many manufacturers are very sceptical about the practical business value in dollars and cents and therefore cling to old-fashioned methods long after their more progressive rivals have seen the new light.

Business Research Not Pure Theory

As a matter of fact business research is not a pure theory or a business principle which only the initiated can carry out. It is really applying old-established business principles in a more scientific and thorough manner than the old-fashioned business man can do under modern industrial conditions.

Many men also have an innate repugnance to the word science. It also conveys to them the concept of pure science or something rather far removed from the realities of business life. What is science anyway ? In its last analysis it is merely a classified body of knowledge showing relations. It may be astronomy showing the relations of the sun, the stars and planets to each other and to the earth or it may be chemistry showing the relations of organic and inorganic matter. But in addition to pure sciences like Mathematics and Astronomy, there are social sciences showing the relations of human beings in their ethical, political or economic relations to each other.

One man may, by chance, drop a letter in the mail box without a stamp and never do the same thing again, but the Post Office Department can figure out, with considerable accuracy, just what per cent of all the letters mailed will be unstamped.

So it is in business. The individual business man may observe as many phenomena as possible and draw his own conclusions. Seeing one letter dropped in the box without a stamp, he may say, one in a million or one letter in one hundred thousand or one in ten million will be mailed in this way. His observations are too limited to enable him to form anything but a vague guess.

If, however, he had before him the data gathered from the records of the Post Office Department, he could draw his conclusions with considerable accuracy. So it is with business research. It is nothing more than the gathering up of all the data bearing on a business problem and then as a result of the analysis, drawing a correct conclusion.

Some years ago a large rubber concern wished to establish a manufacturing plant in the Orient. Instead of sending its officers on a junket through Asia to observe conditions and as a result of limited and superficial observations determining where to build its plant, it turned to its research department.

This department proceeded to analyse all the factors bearing on the ideal location for such a plant. It analyzed labor supply, freight rates, nearness to raw materials, nearness to markets, Government regulations such as taxes and labor regulations, and numerous other factors. After these data had been compiled and compared, the rubber company was in position to determine in what part of Asia to locate its new plant. In these days a manufacturer requires much greater closeness to the market than previously. In designing materials it is absloutely necessary to have a clear conception of their final uses.

Importance of Marketing

It is necessary to find and produce goods that will sell, but it is also necessary to discover how these goods may reach the final consumer with the least possible friction.

Any one, in these days of mechanical invention, realizes the importance of ball bearings in reducing friction in transportation, but very few businesses

have ever faced the problem of eliminating or reducing the friction in merchandising.

What may an efficient worker actually do for his company ?

In the first place, he will ascertain the relative importance of the different materials produced by his firm and make a graph showing their sales over a period of years. Then he will classify the different products according to the final uses to which they are put. This, in the case of some chemicals, will involve considerable labor as they may enter into a thousand and one different finished products. The results will show the major uses of the product in question and it may be possible to compare the prices and sales trend of the leading finished goods over a period of years.

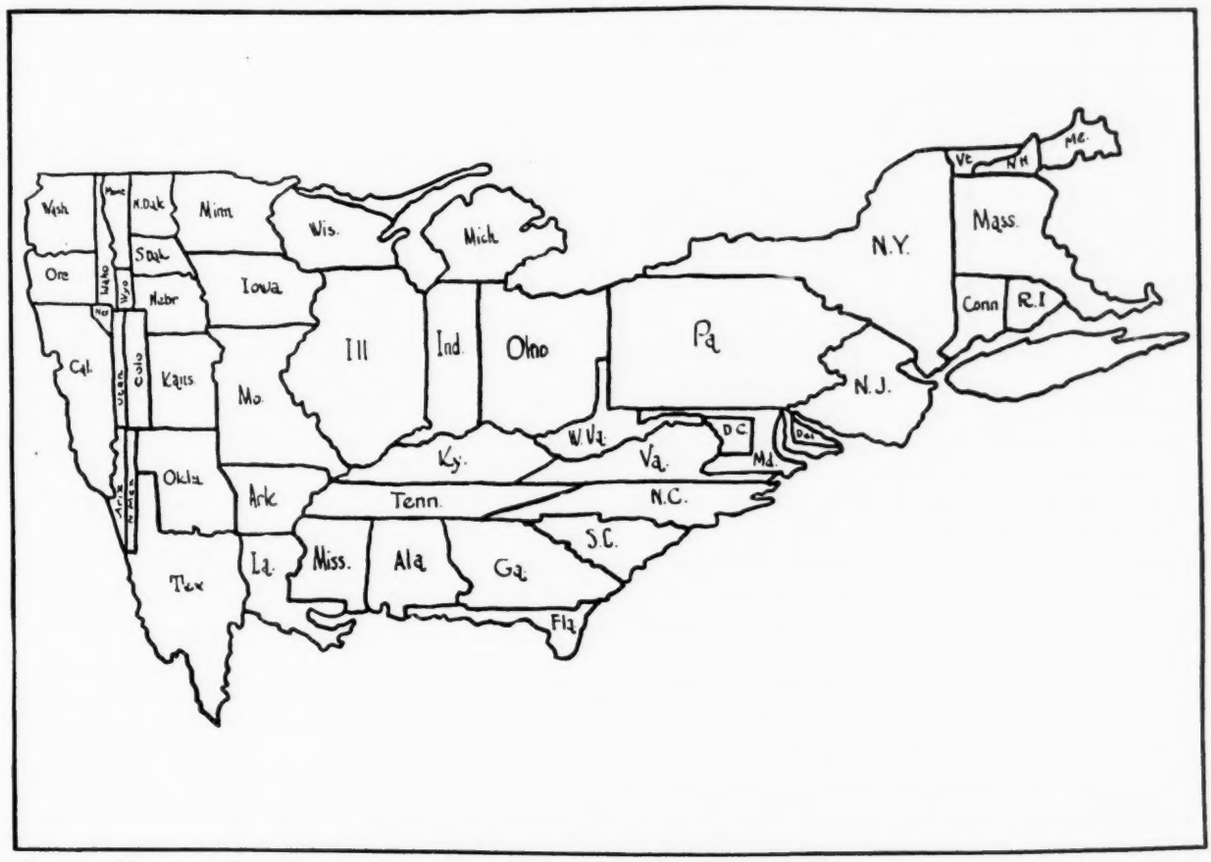
The study may show the causes for the decreased utilization in some lines and increase in others. Often the decrease may be traced to the use of substitutes for the firm's products as where substitutes for turpentine are used instead of the real turpentine or the use of rayon for the geniune silk obtained from the silk worm. The sales analyst will know before he has completed his task whether the use of turpentine substitutes represents a cause for the decrease in the sales of the real product or whether the sale of the artificial product has stimulated sales of turpentine products in general.

The research analysis will show the breadth of the market for the products consumed. This in some cases is determined by the age and classes of consumers who use them. A thorough going investigation may show the number of different classes of consumers and by comparing these with the numbers reported in the census of occupations, he can estimate the potentialities of the whole market.

Again, demand is often seasonal and the analysis will show what seasonal or climatic conditions affect the consumption and to what extent. Furthermore, demand is always influenced by prosperity or business conditions. Charts showing the purchasing power of different communities determine when the product may be pushed and where extensive advertising may be waste of money.

It is often possible to secure a great deal of information from sales and shipping records. These will show the general trend of sales, the prices of the leading products sold and the geographic distribution of the sales. These records will show the sizes of the orders, the seasonal variation of sales and the many other items.

Another valuable source of information for the research analyst, is the Government publications. For example, the census reports show the relative importance of the chemical industry as a whole compared with the leading industries of the country. They also show the relative standing of the various products within the chemical industry itself. Trade papers, trade association reports and, in European countries, reports of Chambers of commerce contain valuable



As geographic areas and market areas are not identical, this market map of the United States has been developed by Bird and Sons to indicate comparative selling areas as based on population.

information as to stocks on hand and production statistics of many commodities.

The most valuable source of information is the company's own salesmen provided they are properly trained and keep proper records. The company salesmen are able to secure from their customers a great variety of valuable information. They can secure estimates of the sales of various goods, the stock on hand and the volume of sales which the customers expect to make in the near future. They can also find out what reasons are given for not buying certain goods and complaints that come to the attention of the customer.

Furthermore, it is possible in many cases to study and analyze consumers' buying motives and buying habits. This is an extremely difficult task and requires elaborate plans and well worked-out methods of application. It is necessary to try out many questions and by a process of elimination gradually evolve a group of tests that may be effectively used and the results of which may be compiled in such a way as to produce clear cut results.

The Field Analysis

In order to do this it is necessary to make preliminary studies on small groups, such as the immediate neighborhood or in some cases the employees of the company. This is generally known as field analysis and is usually used to supplement the data obtained from the salesmen and other sources.

The field analysis may consist of sampling or securing returns from small groups of individuals in different parts of the country. In many cases it is necessary to use personal interviews to secure the desired information. Where most of the information has been secured by personal interviews, it may be necessary to secure additional data from questionnaires sent by mail to a selected group of consumers. These have to be selected with great care or the percentage of replies will be very small.

In order to compile the result, it is often desirable to employ a card system with a tabulating machine for computing the statistics. When the returns come in they are entered by punching cards for each item desired and, when all the data have been so treated, the cards are run through the machine showing all sorts of information. One New England company uses this method to secure total sales of products, total special line sales, total special job sales, total sales by line used, and sales by salesmen and territories. By means of its card record the company is able to adjust its production schedule to the needs of industry.

When an analysis of a certain salesman's territory is desired, it is an easy matter to separate these cards and the preparation of the entire analysis requires but a few minutes.

It is necessary to bear in mind that geographic area and market areas are not identical. Market area is determined by population within the territory and varies greatly in different sections of the country. It is determined by the size of population and not the size of the territory.

The accompanying market map developed by Bird and Sons, and reproduced in the Metropolitan Life Insurance Bulletin No. 2, gives a clue as to the selling areas where population is the great factor in sales. Similar maps can be constructed showing market areas where the manufacturer rather than the final consumer is the chief marketing factor.

The Metropolitan Life Insurance Company in its research bulletins, has prepared a number of forms for sales analysis work, showing the scope and character of the records in use by different types of companies.

Sales records properly equipped inform the management what the salesmen's records are, and in addition throw light on waste of effort on the part of salesmen. One company found that the cost of each call was a little over $18.00. A great many calls resulted in no sales whatever and others brought sales aggregating eighteen dollars or less. In one case, a salesman's calls on a certain firm cost the company several hundred dollars, while the sales were negligible.

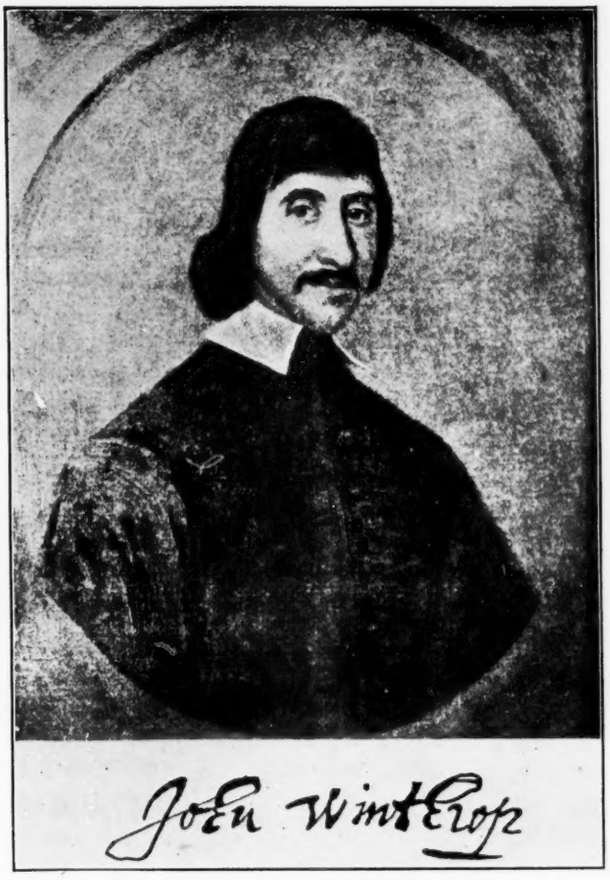
On the other hand, it must be remembered that, the actual additional cost to the company may be nothing where a salesman visits a small town and has time on his hands before he can catch the next train.

Sales and Production Tie-Up

Proper sales analysis are necessary in order to have better control over sales activities. More important still is the bearing this information has in the production activities. It serves as a sort of business barometer and if properly used will furnish the advanced information on their own products several weeks ahead of the regular business barometers, such as those published by the Harvard Bureau of Business Research.

Business research is very important to a company in its credit or financial activities. An illustration in the very excellent editorial in the April issue of CHEMICAL MARKETS, is well worth repeating. A case is cited of a successful company which had been in business for fifty years, with capital of $20,000,000, and average earnings of $2,000,000 per annum. The company owed no debts and manufactured its own products, marketed them through its chain stores and controlled the leading companies producing allied lines.

When this first class concern applied for credit, the head of the underwriting syndicate objected to the loan on the ground that the company did not have its own research department. For one or two fundamental changes might wipe out the company in less than two years. "Research" said the banker, "is the only insurance against this hazard, far more disastrous, if it occurred, than fire."



John Winthrop, Jr., who in 1650, just thirty years after his father led the Mayflower Pilgrims ashore, organized the first American chemical stock company.

Chemical Backgrounds

By Williams Haynes

POPULAR belief often and erroneously holds that the American chemical industry is a lusty child of the World War, an opportune and extremely profitable industry which we as much as stole from Germany under the protecting guns of the British navy. As a matter of fact, the value of our chemical products, just prior to the war, was something in excess of two billion dollars, or a twelfth of all our manufactured goods, a total exceeded only by the foodstuffs, the textile, and the iron and steel industries. Furthermore, the chemical industry was the very first established in the American colonies.

Present Policies Influenced by Past

To-day, with rapid-fire mergers tending to destroy the identity of many chemical companies, it is of particular interest to review the background of the American chemical industry. These chemical backgrounds throw an illuminating light upon the experience, the resources, and the past connections of the more important chemical producing companies, and as shown in some of the recent mergers, often prove to have a direct bearing even to-day upon programs and policies.

In 1608, the London Company, which financed the settlement at Jamestown, disappointed in their hope of finding gold, sent out skilled workmen to undertake the manufacture of glass, pitch, and tar, and the first cargo of exports from Virginia listed in the manifest "trials of pitch, tar, glass, frankincense, and soap-ashes".

The bitter struggle against starvation left little time for the pursuit of these industries, and after 1612, when John Rolfe began to cultivate tobacco, this crop quickly became the principal export and the main source of cash income. Accordingly, these seeds of chemical industry did not flourish on Virginia soil. The glass factory did continue to supply the local demand for several years. The naval stores and potash industries transplanted to more favorable locations, where they did not have to compete with the highly profitable tobacco, soon became important factors in American export trade.

Naval Stores and Potash

Indeed, since earliest colonial times until this day, American rosin and turpentine have dominated the world's naval stores markets, and American pot-ashes were only driven from a similar commanding position after 1860, when the Prussian Government began to exploit the famous Strassfurt deposits. Thus two chemical raw materials industries, established in the second year of the first American colony, became the real beginning of our manufacturing activities, and were so preemiently successful that they won and held an important place in world commerce.

In colonial days our manufacturing activities were extremely limited, nevertheless, along with agriculture, there was considerable exploitation of the natural raw materials of the seaboard area. Several of these were chemical in character. The early development of naval stores supplies was encouraged by a bounty to producers authorized in 1704 by the British Parliament. The burning of wood in iron pots served the double purpose of helping to clear land and furnishing occupation during spare times, while the finished product, potash, was valuable as fertilizer and for soap making, was easily transported, and carried a high price. Animal fats and fish oils were manufactured into candles to an extent that gave an exportable surplus sent chiefly to the West Indies. Among the forest products were tanning extracts which were used in preparing fur skins for export and in tanning leather for domestic use. Natural dyewoods were used in the homespun textiles (a tax on imported dyewoods being one of the favorite revenue measures

(Enlarged from a cut in the *Schepe-Tagt van Anthony Chester Na Virginia, gedaan in het jaar 1620.* Printed at Leyden by Peter Vander, 1707. A pamphlet. 12mo.)

An early view of Jamestown, the first American settlement to begin the manufacture of chemicals. The first cargo of exports in 1608 listed "trials of pitch, tar, glass, frankincense, and soap-ashes".

of several of the colonies) and in 1741, Eliza Lucas introduced the cultivation and extraction of indigo in North Carolina, an industry that grew for a century and prospered till killed off by quicker and cheaper communication with India during the height of the clipper ship era.

In 1650, just thirty years after his father led the Mayflower Pilgrims ashore, John Winthrop, Jr. organized the first American chemical stock company. Its purpose was the production of saltpetre for the manufacture of gunpowder. Two years before he had been commissioned by Massachusetts to manufacture salt, and the year following he was granted the first monopoly offered by Connecticut for working lead, copper, tin, alum, and vitriol.

American Chemical Families

This astute and scientifically minded scion of the Puritans was, therefore, our pioneer chemical industrialist. Since he was financially supported in these enterprises by his father, and as they were carried on by his son, Fitz-John, the name of Winthrop has a proper place along with du Pont, Grasselli, Wilder, Lennig, Innis, Kalbfleisch, Nichols, and Rosengarten on the rolls of those illustrious families long and closely associated with American chemicals.

Production of salt and gunpowder, essential in frontier life, was undertaken in most of the colonies at different times and with varying success. The tannery at Ipswich, the fulling mill at Rowley, the glass works at Sandwich were but pioneers of a long series of local chemical process industries established in New England. At Boston and Philadelphia, then the most important commercial cities, various efforts were made to supply the growing demands for bleach, alum, and acid; and the preparation of dyestuffs and tanning extracts assumed quite sizable proportions. It is recorded that in 1770 William Molyneaux opened a commercial dye-house, with a complete assortment of natural dyes and a skilled staff of bleachers and dyers.

All these brave little chemical attempts, inspired by bitter need, won only sporadic success. Except for the exploitation of our natural raw materials—fish oils, potash, tannins, and naval stores — they remained local in character, and usually vanished with the passing of the enterprising individual who undertook them. Lack of experience and of chemical knowledge, restricted markets and limited capital, generally brought extermination before any permanent progress was made. Not until after the Revolution do we find the true beginnings of our chemical industry.

Wilder Family Pioneers

About 1780 Caleb and Joseph Wilder made distinct progress in the process of leaching potash out of hardwood ashes. This advance in what was then the most important chemical industry of the country had two interesting historical sequences. The first patent issued in the United States, several years after the Wilder invention, covers this identical chemical process; and Salmon W. Wilder, great-grandson of the first American patentee, has for many years been at the helm of the Merrimac Chemical Co., the largest chemical manufacturing business in New England.

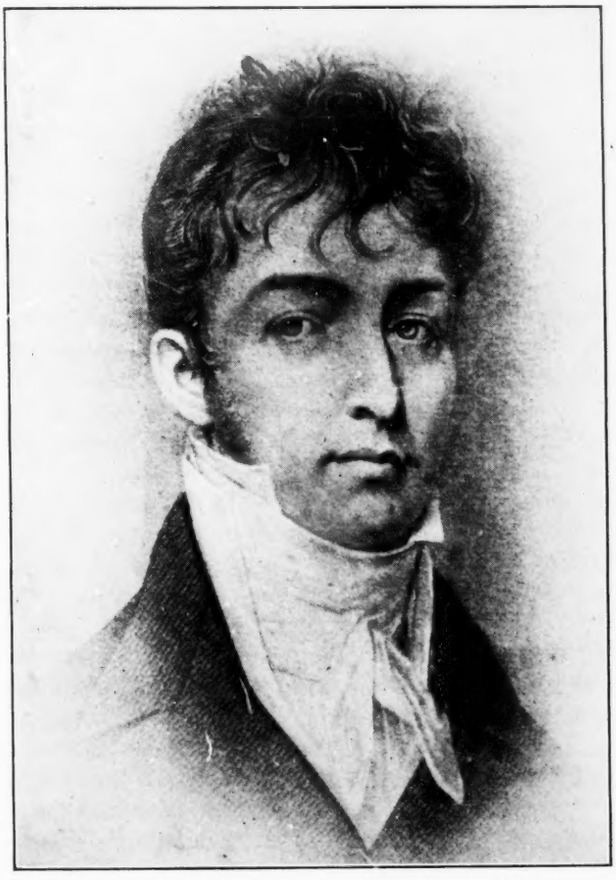
In 1792, John Harrison built at Philadelphia a tiny sulfuric acid plant, and laid the first stone in the foundations of the American chemical industry. Two years later he crossed the ocean to study the most approved European methods of manufacture, and by 1806 he had expanded his chamber system to an annual capacity of half a million pounds of chamber acid, which is just about the daily output of a modern unit.

In 1801 Thomas Jefferson, who agreed with his great political rival, Alexander Hamilton in his keen interest in the industrial development of the young republic, inspired E. I. du Pont de Nemours to embark in the manufacture of explosives at Wilmington, Delaware. By 1818 the industrial frontier has crossed the Allegheny Mountains and a demand for acids and other chemicals been created which lead to the establishment of a chemical plant at Steubenville, Ohio, by the Grasselli family. This bold enterprise, a true industrial pioneer westward of the seaboard

fringe, furnishes a beautiful example both of the importance of chemicals in industry and of the dependence of chemical manufacturing upon industrial consumption, for the subsequent development of the Grasselli Chemical Company is interwoven with the growth of the vast petroleum and steel industries of western Pennsylvania and Ohio. The purchase of the John Harrison & Sons Company by the Du Pont Company in 1920, and the consolidation of this and the other heavy chemical activities of the Du Ponts with the Grasselli interests in 1928 binds together three of the most historically significant companies in our chemical industry.

The First Sulfuric Acid Plant

John Harrison's initial sulfuric acid unit was a tiny lead chamber producing 300 carboys of sulfuric acid a year. In 1807 he built a lead chamber 50 feet long, by 18 wide and 18 high, quite a giant apparatus, even judged by the operations he had visited on his trip to Europe. This increased his output to a total of half a million pounds, sold at an average price of 15 cents



John Harrison, who in 1792 built at Philadelphia a tiny sulfuric acid plant with a capacity of 300 carboys a year.

a pound. In 1814, Mr. Harrison, taking advantage of the chemical discovery of his fellow Philadelphian Wollaston, replaced the glass stills for concentrating his acid, by a platinum lined still of 25 gallons capacity. This was built for him by Dr. Eric Bollman and ran successfully for a quarter of a century.

That our first chemical endeavor should be the manufacture of this widely used acid was quite natural. A considerable market existed ready-made, and the high freight rates charged to compensate ship owners for the extraordinary risks of transporting this dangerous material packed in glass, created an attractive differential between production cost and selling price. It was therefore, not long before the pioneer plant had competition. In 1823, the New York Chemical Manufacturing Co. was chartered to make "blue vitriol, alum, oil of vitriol, aquafortis, nitric acid, muriatic acid, alcohol, tartar emetic, refined camphor, saltpetre, borax, copperas, corrosive sublimate, calomel, and other drugs, medicines, paints, and dyers' colours". After purchasing the factory of John C. Morrison, then a leading wholesale druggist, they expanded the business by entering the acid and industrial chemical field. The drug factory was in Greenwich Village, on the west side of Hudson Street and the south side of the Great Kill Road, now Gansevoort Street. The price paid was $37,219. As Mr. Morrison, with James Jenkins, Geradus Post, and Charles G. Haynes, were the organizers of the new company, the price must have been satisfactory, and it is interesting to note that most of the value must have principally represented the cost of buildings and equipment, since after the chemical company had moved way out into the country (on the Hudson River between Thirty-second and Thirty-fourth Streets) the Greenwich Village plot, with the factory razed, brought only $6,000.

Early Competition in Philadelphia

Competition for Mr. Harrison sprang up closer to home. In 1818, at Arch and Twelfth Streets, Philadelphia, Farr and Kunzi began the manufacture of acids. They were joined in 1829 by a young Englishman, William Weightman, the firm eventually becoming Powers and Weightman. A few years before, in 1822, Rosengarten and Sons entered the Philadelphia chemical field, although from the first their efforts were directed more towards medicinal than industrial products. On the death of William Weightman, at the ripe age of ninety-one, these two firms consolidated in 1905 and became Powers-Weightman-Rosengarten Co., which combined in 1927 with Merck & Company, younger American transplantation of the old German drug house of Merck of Darmstadt.

The First Chemical Price War

Of John Harrison's early competitors however, the most potent was Charles Lennig, who in 1829, erected at Bridesburg, near Philadelphia, the largest sulfuric acid chambers yet attempted. A preeminently successful manufacturer and an agressive salesman, the first Lennig soon set a competitive pace that,

The first home of E. I. du Pont de Nemours & Co. built by the founder of the company in 1802, one year after he had embarked in the manufacture of explosives at Wilmington, Delaware.

combined with the efforts of Maryland Chemical Works and the Baltimore Chemical Works who entered the market in 1829, precipitated the earliest chemical price war. These unsettled conditions doubtless had a good deal of influence in switching the chemical activities of the New York Chemical Manufacturing to the banking end of their business, and eventually to the abandonment of the chemical enterprise and the establishment of the Chemical National Bank. However, their chemical manager, Martin Kalbfleisch, a young Hollander who had been educated in France, continued in the business, establishing himself as a maker of Paris green, yellow prussiate of potash, and dry colors.

Beginnings of Diversification

While sulfuric acid was logically the starting point of our chemical operations, other products were by no means neglected. In the burst of patriotic enthusiasm that fired the founders of the Republic to win commercial self-sufficiency, now that political independence had been attained, every possible incentive was held out to manufacturers of all sorts of goods. Amid these industrial activities, new demands arose for all sorts of chemicals. The established chemical manufacturers added to their products. John Harrison produced white lead as early as 1806, and, just as the Rosengartens began to specialize in medicinal chemicals, the Harrisons turned more and more to supplying the raw materials of the paint industry.

New manufacturers were also tempted into the industry. At Poughkeepsie, N. Y. a dyewood mill was started in 1816 by Aaron Innis who furnished the capital for the enterprise which was managed by his son-in-law, Howland Sherman and George Gifford. This firm passed in 1885 to the control of William and Hasbrouck Innis, grandsons of the founder, and under the style of Innis & Co. was purchased by George V. Sheffield in 1904. Two years later, Clement C. Speiden became a partner and the name was changed to the present Innis Speiden & Co. Up in Massachusetts, at Lowell, Alexander Cochrane established one of the first and most successful indigo manufactories, a business that died out only after the introduction of coal-tar dyes. At North Adams, in 1830, James Ward began the manufacture of Iron liquor.

Over a Million Capitalization by 1830

By 1830, J. L. Bishop has estimated at least thirty different chemical manufacturing firms in the United States, with a total capitalization of $1,158,000 and an aggregate output in excess of a million dollars a year. Remembering that ten years later—the Census of 1840 being the first whose figures on industry and trade are reputable the total manufactures of the country were given as $483,278,215, it is evident that chemicals were not an inconspicuous element in the earliest industrial development of the country. Before securing the growth of the entire industry up to the new era initiated by the World War, however, it will be useful to trace out some of the most significant economic developments in the more important groups chemicals.

(To be continued)

The Increasing Use of

Aluminum Chloride

As a Wool Carbonizer

By R. O. Fernandez

Chemical Engineer, Merrimac Chemical Co.

ALUMINUM chloride is rapidly gaining favor as a chemical particularly adapted to the process of wool carbonizing. The purpose of this article is not to urge the use of aluminum chloride to the exclusion of the other two chemicals used for the process, namely, sulfuric acid and muriatic acid, but to point out certain of its valuable properties which possibly have not been generally recognized.

Aluminum chloride is usually supplied to the woolen manufacturer or job carbonizer as a solution, the strength of which is about 50 per cent Al_6Cl_2. $12H_2O$. the specific gravity of this solution is 1.283 corresponding to 32° on the Baume scale. More concentrated solutions may crystallize in containers during the winter months. The containers are carboys or tight barrels. For those desiring a dry material, or in cases where a saving in freight is worth while, the crystallized salt is available. Aluminum chloride (a salt of a strong acid and a weak base) is of course strongly hydrolyzed in aqueous solution and reacts acid to most indicators; tropeolin 00 and congo red are not affected. Both solution and crystal are non-corrosive, non-poisonous, are not regarded as a fire hazard, and may be shipped without railroad regulation.

The use of this material as a carbonizing agent was first introduced into this country in the early eighties after successful trials abroad. Its use has increased yearly until at present at least 20,000 tons of wool are carbonized by this process in New England alone. The change from acid to aluminum chloride carbonizing required few changes in equipment and its introduction met with little resistance for this reason.

Photograph showing the relative effects of aluminum chloride and sulfuric acid carbonizing. Note the light color and the fluffy "open" appearance of the alumina carbonized stock, as contrasted with the dark and felted appearance of the acid carbonized wool.

The process of burr removal by carbonization either of loose wool or piece goods is familiar. It consists briefly of immersing the wool in a dilute solution of aluminum chloride or acid, extracting first with squeeze rolls and then centrifuging. Drying and baking decomposes the vegetable matter. In piece goods the burrs are crushed by a dry mill, and in raw stock by a specially designed burr crusher with corrugated steel rolls and beaten out in a willow or duster. In acid carbonization the wool is then neutralized with dilute alkali and dried.

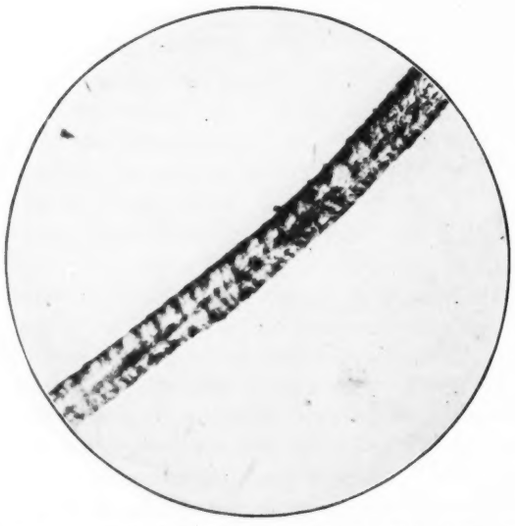
If the action of the chemicals used for carbonization could be confined only to the vegetable matter (burrs, shives, slivers, etc.), the problem of carbonization would be greatly simplified. The wool fibre, however, undergoes the same treatment as the burr for better or for worse (ofttimes worse), but the fibre performs a necessary function as a vehicle for the carbonizing agent. It is not likely that sufficient carbonizer could be absorbed in the saturating vat by these hard, woody, foreign materials for their carbonization. Then, to judge the efficiency of a carbonizing agent, we must note its effect not only on the burrs but on the wool itself.

In order to compare the effects of aluminum chloride and sulfuric acid carbonizing processes on the wool fibre, two samples of the same lot of South American cross-bred wool were carbonized by both

methods. The accompanying illustrations contrast the effect of these methods on the wool fibres. It will be noted that the aluminum chloride carbonized stock is whiter and more "lofty," while the wool carbonized by the sulfuric acid has a darkened and felted appearance. The contrast in loftiness of the samples can be estimated only by taking them in hand and noting the comparative deadness of the acid carbonized stock.

Under the microscope, the fibre shows a marked roughing up after sulfuric acid treatment, which is not at all surprising in that an almost identical acid treatment is a necessary preliminary process in the manufacture of felt. The fibres from the aluminum chloride process are as smooth and glossy as before treatment. Under higher powers, magnification 240 diameters, at which the accompanying photomicrographs were taken, the actual effect on the structure of the fibre becomes apparent, particularly the corrosive effect of sulfuric acid on the fibre surfaces.

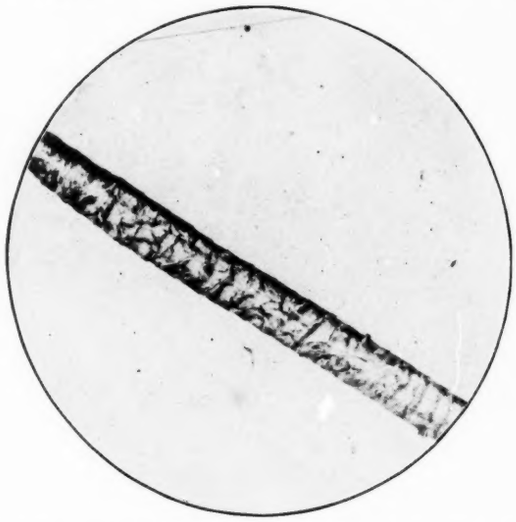
The chemistry of the process of carbonization is the dehydrating action on cellulose of dilute mineral acid and subsequent drying. Hydro-cellulose is the decomposition product which, though its structure is the same as that of the original cellulose, possesses none of its strength and crumbles away at the slightest pressure. Aluminum chloride furnishes the necessary acid during the carbonizing process in the dryer, first by hydrolysis while the wool is moist, and then by decomposition after the wool reaches the hot end of dryer. An extremely finely divided, inert, hydrate of alumina remains in the wool, which is dusted out in subsequent treatment.



Typical fibre of sulfuric acid carbonized wool. Note obliteration of sharply defined scale structure, and a roughening along the edges of the fibre. Mag. 240 diam.

A sample of aluminum chloride carbonized raw stock after crushing and dusting was examined for total alumina, by extracting with boiling N2/HC1. A mere trace of alumina was found 0.05 per cent total oxide, showing the complete removal of alumina mechanically. The complete removal of alumina is regarded by some as essential where dyeing is to follow. In piece goods the removal is certainly more difficult, and some manufacturers go to the extent of soaking in dilute muriatic acid and subsequently neutralizing.

The hydrochloric acid liberated during carbonization is largely volatilized out of the fibre at the working



Typical fibre of aluminum chloride carbonized wool. Note sharply defined scale structure intact, and close resemblance to the untreated fibre. Mag. 240 diam.

temperature 240°-260° F. The amount remaining, though it may not be in actual chemical combination with the wool, is extremely firmly held. An analysis of a sample of carbonized stock showed 2.262 per cent HC1. There seems to be some difference of opinion as to the effect of this acid on dyeing operations. A large carbonizing company has been turning out aluminum chloride carbonized stock for years and they state emphatically that such stock gives general satisfaction. Some companies, however, neutralize before dyeing, contending that more level effects are obtained. This acid cannot be disregarded if mixed cotton and woolen goods are to be manufactured, as even a slight amount of mineral acid causes tendering. Neutralization must follow. A case of rusting of card clothing by residual acid in raw stock has come to the attention of the writer, but it was found that the baker was being operated at only 180° F. due to low steam pressure. Although carbonization takes place at these low temperatures, it is not advisable to so operate, for the undecomposed aluminum chloride remaining in the fibre may interfere with subsequent dyeing operation.

In aluminum chloride carbonization it is evident that the carbonizing action is purely one of dehydration. Sulfuric acid carbonization, if ideal, should react in a similar manner, but unlike the hydrochloric acid from the hydrolysis and decomposition of aluminum chloride, sulfuric acid is an oxidizing agent and that it does actually oxidize is quite evident by the fumes of SO_2 from the baker. That this oxidation is entirely due to action on the relatively

small amounts of vegetable matter in the wool is doubtful and it is likely that the slight darkening obtained with sulfuric is due to actual oxidation of the wool fibre. The action of heat in aluminum chloride carbonization expels the hydrochloric acid, while the action of heat in sulfuric acid carbonization concentrates the acid. The destructive action of concentrated sulfuric acid on all textile fibres is well known.

In order to retain the fine spinning and weaving qualities of uncarbonized wool, the woolen manufacturer oft n defers carbonizing until after weaving. And to avoid the vagaries that carbonizing may cause in the dyehouse, carbonizing may be deferred until after dyeing. If the latter be the case, the dyer must select his dyes from tables which indicate those which are fast to carbonizing. These tables are published by dye manufacturers and are complete with regard to sulfuric acid carbonization. All those dyes fast to acid carbonization are implied to be fast to aluminum chloride and no restrictions are made as to its use. This hardly confirms our own observations. It is true with regard to the run of acid dyes, but aluminum chloride has a marked effect where lake formation is possible; a dulling and deepening of the shade is noticed with Patent Blue V, Metanil Yellow, and Chromotrope 6B. A tendency to decompose Naphthol Green B was also noted. This is not remarkable in that the latter is an iron salt of a nitroso compound. With the exception of Naphthol Green B no actual destructive effect on dyestuffs has been observed.

With sulfuric acid an actual destructive effect was observed in the case of chrome colors. Alizarin V was badly reddened after acid carbonization, and Anthracene Brown W was badly yellowed. It is possible that the acid exerted a solvent action on the chrome which profoundly affected the color.

Until more detailed information in regard to fastness to aluminum chloride carbonization is made available by the dye manufacturers, the dyer himself must test the color in this respect by sewing the dyed yarn directly into the gray piece and noting tendencies to dull or bleed in the carbonizing process.

The action of aluminum chloride on dyed wool, as far as acidity is concerned, would be similar to dilute sulfuric acid. The color of acid-sensitive dyes, however, is usually restored on neutralization. Dilute acids as a rule exercise no undesirable effects, as most wool dyes are applied in acid solution.

The tendency of aluminum chloride like other aluminum salts is to act as a fixing rather than a stripping agent. The troubles with bleeding and stripping that sometimes occur in sulfuric acid carbonization are not brought about by the action of dilute acid in the saturating vat, but by the concentration of the acid in the dryer. Here the dyestuff is not only subjected to the solubilizing action of sulfuric acid due to sulfonation, but also to the oxidizing action at these temperatures and concentrations.

The inaction of aluminum chloride to wool dyes is not only of advantage to the carbonizer of piece goods, but also to the carbonizer of shoddy, where re-dyeing may be avoided.

As for other carbonizing agents, magnesium chloride requires too high a temperature to bring about its decomposition in the dryer. Hydrochloric acid gas requires special equipment and it is difficult to bring about intimate contact between gas and burr.

Wool for aluminum chloride carbonization must be scoured and the soap thoroughly rinsed out, as otherwise aluminum soaps form which may act as a resist in future dyeing operations. In operation the process resembles the acid process. The acidity of the saturating vat must be followed by titration. Wool exercises a selective absorption for acid in aluminum chloride solutions, in other words, wool removes hydrochloric acid more rapidly than alumina, and acid may be added at intervals to re-establish the

Typical fibre of scoured wool. Note sharply defined scale structure. Mag. 240 diam.

initial ration of hydrochloric acid to alumina in the solution. This addition is usually made when the level of the tank has fallen so that it is necessary to replenish the carbonizer. Thirteen gallon carboys of liquid carbonizer 32° will make up about 50 gallons of 10° Be. liquor. The practice is to add water and then aluminum chloride until about 10° Be., titrate with standard acid, and add the required amount of muriatic acid 22°. The titration is simple. The standard acid and a calibrated measuring glass are furnished by the chemical manufacturer, the calibration depending on the dimensions of the saturating tank. The ounces of muriatic acid 22° necessary to add per inch of liquor is simply 5 less than the number

of cubic centimeters of standard acid used in the titration. With reasonably uniform operation the amount of acid bears a direct relation to the amount of fresh carbonizer added and once the relation is established the test may be dispensed with. The goods after a brief soaking are then squeezed and wrung as dry as possible in a hydro extractor (preferably rubber lined), or passed over a vacuum extractor. The carbonization takes materially longer than drying and the best conditions are those in which the wool is not exposed to the higher temperatures of the baker until thoroughly dried. In carbonizing raw stock the operation is often conducted in a single dryer, the temperature of the wet end being several degrees below the highest temperature. With piece goods the goods may be dried on steam-heated drying cans. For complete carbonization the stock should be baked 15 minutes at 250°F. The removal of carbonized burr is purely a mechanical affair. Neutralizing agents when necessary are weak solutions of soda ash or better, ammonia.

As for the consumption of chemicals in the aluminum chloride process, one pound of liquid carbonizer will carbonize about 5 pounds of wool. This is much better than the average obtained at some plants where the liquors from the hydro extractor are allowed to run to waste, a highly undesirable situation from their standpoint. The ratio of muriatic acid 22° to aluminum chloride used is about one pound to ten pounds.

As far as costs are concerned, aluminum chloride carbonizing is slightly more expensive than acid, but in the opinion of aluminum chloride users, the results obtained and the feeling of safety with respect to fibre condition more than offsets the difference in chemical costs.

United States Chief Source of Canada's Imports of Sodium Salts

Canadian imports of sodium compounds during the year ended March 31, 1929, reached 150,000 tons, valued at $3,700,000. These figures represent a substantial gain in volume and value over the trade of the previous year. Although the United States was the chief source of supply, having furnished $2,800,000 worth of the total imports, there were a number of individual items in which the American participation was relatively low. The three principal items in this category were cyanide, chlorate, and prussiates. Great Britain supplied 1,750,000 pounds of the 2,150,000 pounds of cyanide imported during the year under review while the United States furnished less than 400,000 pounds. Of the 1,900,000 pounds of chlorate imported, the United States furnished 225,000, Germany 600,000, and the United Kingdom 200,000. Imports of prussiates were 307,000 pounds.

Russia is attempting to replace citric and tartaric acids by lactic acid wherever possible. Earlier reports have indicated plans for the production of this acid in large quantities in Siberia, and a more recent report indicates the impending manufacture of the acid by the Chamownitzchesk Brewery. It is estimated that Russia's needs in lactic acid by 1930 will be about 700 tons.

The Industry's Bookshelf

Salesmanship for the New Era, by Charles Willard Mears, 223 pages, Harper & Bros., New York, $3.00 net.
Selling methods to please the prospects is the keynote of this book.

General College Chemistry, by Joseph A. Babor, 586 pages, Thomas Y. Crowell Co., New York, $3.75 net.
A modern textbook which builds its text loosely upon the atomic structures.

Laboratory Manuel in General College Chemistry, by Joseph A. Babor, 376 pages, Thomas Y. Crowell Co., New York, $2.00 net.
Prepared to accompany Babor's "General College Chemistry."

A B C of Television, by Raymond Francis Yates, 210 pages, Henley Publishing Co., New York, $3.00 net.
Containing descriptions of television systems and information containing experiments for amateur experimenters.

Aviation from the Ground Up, by Lieut. G. B. Manly, 373 pages, Drake Publishing Co., Chicago, Ill., $3.50 net.
Information for the layman interested in aeronautics.

Kings of Commerce, by T. C. Bridges and H. Hessell Tiltman, 288 pages, Thomas Y. Crowell Co., New York, $3.00 net.
Intimate sketches of those more generally known as captains of industry.

Evolution of Industrial Organization, by B. F. Shields, 308 pages, Isaac Pitman & Sons, New York, $3.00 net.
Interesting study in economics which traces the growth and development of present-day-policies.

Economics and Ethics, by John Atkinson Hobson, 489 pages, D. C. Heath & Co., Boston, Mass., $4.00 net.
A text which introduces the student to the subject of economics from the standpoint of ethical values.

Textile, Fibers, Yarns and Fabrics, by Helen A. Bray, 236 pages, Century Co., New York, $2.50 net.
A textbook, covering in concise manner the entire textile field with information required for intelligent selection purchase and use of textiles.

Chemistry in Daily Life, by Glasstone, Samuel, 250 pages. E. P. Dutton & Company, N. Y. C., $2.25 net.
The achievements of chemistry in their effect upon our daily existence.

The Soviet Union Looks Ahead, 275 pages, Horace Liveright, New York, $2.50 net.
The five-year economic plan of the U. S. S. R., together with conclusions drawn from the discussions which accompanied the plan's preparation.

Practical Plant Biochemistry, by Muriel W. Onslow, 206 pages, MacMillan Publishing Co., New York, $4.00 net.
A text book outlining practical work for students of botany.

Economic Resources and Industries of the World, by Isaac Lippincott, 656 pages, D. Appleton & Co., New York, $5.00 net.
A study of the world distribution of supplies of raw materials and of the industrial development of the important producing areas and countries.

Chemical Fire Hazards

Shortly before his death, the late Robert C. Ingalls prepared this article in which he points out that public ignorance concerning chemical fire hazards usually leads to superfluous restrictive industrial legislation. It behooves the manufacturer and seller of chemicals to educate the user to the safety conditions required that there may be no excuse for ill-advised and unnecessary regulations.

By Robert C. Ingalls
President, Doe & Ingalls, Inc.

MANY varying and more or less conflicting interviews, statements and opinions indicate the very general lack of knowledge regarding celluloid and the various solvents and inflammable liquids so useful and necessary to industry. As is perhaps only natural, popular understanding and knowledge of many materials of great importance and value and widely employed in modern industry, is extremely limited and usually incorrect. Many of these materials are of complex chemical structure, are made, sold and used under scientific names which mean little or nothing to any except those with chemical knowledge and experience. Even those in common use under simple, familiar names are usually but little understood even by the users, who in most instances know only the particular use for which they are valuable in their own art or industry.

Knowledge of Hazards Necessary

Yet public officials responsible for public safety and health; fire and police executives; insurance officials, newspaper editors and industrial employers ought to have at least an elementary knowledge of such materials to permit intelligent consideration of hazards involved in their manufature, handling, and use. Thus the public and the individual workman may be protected, and, on the other hand, industry may not be unwisely and unnecessarily hampered.

One of these materials most commonly and most generally least understood, is nitro cellulose, otherwise known as pyroxylin, or soluble cotton. Soluble cotton is to-day one of the most valuable and generally useful substances known to modern industry. It is used in the manufacture of numerous products of general use contributing to human comfort and enjoyment, on which a vast industry employing thousands of men and women is built. Soluble cotton is not gun cotton and never should be referred to as gun cotton.

Gun cotton is another and different form of nitro cellulose and is of no use and interest in the manufacturing industries. It has different properties from soluble cotton: it is the explosive form of nitro cellulose and is not soluble in the solvents usually employed in the industries.

Another material in common and general use and very imperfectly understood by the general public is celluloid. Celluloid is a privately copyrighted name for one of the commonly known pyroxylin plastics. It is a mixture of soluble cotton and camphor and is one of the best known and most useful commodities. Contrary to a common but erroneous belief, celluloid is not explosive. It is, however, highly inflammable, and burns rapidly and fiercely, generating intense heat which is radiated for considerable distance, and in burning noxious gases are generated. Every possible precaution therefore should be taken to guard celluloid against fire, and bulk quantities should be stored outside of main factory building and 125 feet distance from other buildings. One feature of importance is that water quenches and extinguishes celluloid fire readily and as far as possible celluloid should be worked in shops equipped with automatic sprinklers, and in cutting, turning and sawing should be protected against frictional heating and sparking.

Pyroxylin Shipped Wet

Soluble cotton is not furnished to the industries in dry form, but is shipped by the manufacturers wet, with approximately 30 per cent of denatured alcohol or in actual solution in solvents or solvent mixtures, in stout metal containers. Soluble cotton and to a certain extent cellulose, are commonly used in solution, the principal solvents employed being denatured alcohol and methanol; ethyl acetate, amyl acetate and butyl acetate; mixtures of ethyl acetate and benzol or toluol; and various mixtures of these and some other less common solvents according to the purpose for which intended.

Denatured alcohol and methanol are pretty well known and understood. Both are inflammable but readily mix with water and present no particular fire hazard. They are indispensable to a great variety of industries. Ethyl acetate, butyl acetate and amyl

acetates have comparatively high boiling and flashing points and present no extraordinary hazard.

Benzol and toluol are coal tar distillates, having low flashing points and vaporize at low temperatures. They are highly inflammable and are hazardous, particularly benzol.

Benzol is not only inflammable but it does not mix with water and therefore if fired may not be quenched with water. It is very volatile and its vapor does not readily or quickly diffuse in the atmosphere. If allowed to collect in an enclosed space it may form a mixture with air which in the right proportions is highly explosive and might be fired by a spark from an electric motor or switch. This constitutes the danger of explosion in plants where lacquers and dopes containing benzol and similar volatile inflammable solvents are used in connection with soluble cotton or celluloid and should indicate the necessity of providing ample ventillation for all drying, spraying and finishing rooms, and of keeping all naked lights away from all places where cotton and cellulose solutions are used.

The necessity of protecting the public from any improper use and handling of hazardous materials is beyond question, but public officials, should know what materials are hazardous together with the nature and conditions of the hazard in order that proper safety regulation may be made effective without placing unnecessary handicaps on legitimate industry.

Newspaper editors should not permit publication of erroneous statements tending to create in the public mind unwarranted fear and distrust of certain substances, not of especially hazardous nature and Legislators should avoid suggesting or proposing ordinances and statutes unnecessarily restricting the manufacture and use of materials not particularly dangerous. Business and industry must necessarily be subjected to so much reasonable and proper regulation to ensure public safety that it should be protected from any unnecessary and ill-considered restrictions.

French Butyl Alcohol Production Amounts to 1000 Tons Annually

French butyl alcohol production is at present from 990 to 1,000 metric tons annually, and of this production almost 400 metric tons are used in the form of butyl alcohol, while most of the remainder is transformed into butyl acetate. The principal French producer of butyl alcohol is the Distillerie des Deux-Sevres at Nelle.

In addition to the domestic production, it is necessary to import fairly large quantities of butyl alcohol. These imports come largely from Germany, where they are manufactured by the I. G. Farbenindustrie. French exports of butyl alcohol are insignificant.

The price of butyl alcohol in France is approximately 10.50 francs per kilo loaded, and for butyl acetate, 11.50 francs per kilo loaded. The above prices are for large orders, and small consumers must usually count on paying from 15 to 20 per cent more.

Who's Who In Chemical Industry

Carr, Robert F., president, Dearborn Chemical Co. Born, Argenta, Ill., 21 Nov. 1871; mar., Louise B. Smiley, Chicago, 1906 (dec. 7 Sept. 1925); children, 1 son, 2 daus.; educat., Univ. Ill., B. S., 1893. With Dearborn Chem. Co., since 1894, pres., since 1907; dir., Continental & Coml. Natl. Bank, Locomotive Firebox Co., Kansas City. Served as Maj. Gen. Staff, U. S. A., Purchase, Storage and Traffic Div. under Gen. Goethals. July 1918-Jan. 1919. Pres. Home for Destitute Crippled Children, Chicago; trustee Univ. Ill., term 1915-21, pres. bd., 1920-21 (donor of fellowship in chem.); chmn. Univ. Ill., Memorial Stadium Com. ($1,850,000 stadium completed, Oct. 1924, funds raised among alumni faculty, and students; dedicated to 180 Ill. men who lost lives in the World War). Memb., Amer. Chem. Soc., Ard Inst., Chicago (life), Chicago Hist. Soc., Field Mus. Chicago (life), Kappa Sigma (life trustee endowment fund). Clubs: University (pres.), Union League, Industrial (ex-pres.), Chicago Athletic, Old Elm, Shoreacres, Racquet, Iroquois, Casino, Chicago Riding, Vernejo (N.M.), Congressional Country (Wash. D.C.), Midwick County (Los Angeles). Address: Dearborn Chemical Co., 310 S. Michigan Ave., Chicago, Ill.

Davies, Thomas Russell, president & general manager, Davies Nitrate Co., Inc. Born, Clifford, Pa., 27 Jan. 1887; mar., Carolyn Read, New York City, 19 May 1923; educat., Lehigh Univ., M.E., 1911. W. R. Grace & Co., engr., 7 yrs.; organized Davies Nitrate Co., 1921. Capt. U. S. A., 1917-19. Developed special processes in refining saltpetre and nitrate of soda. Memb., Masons, Shrine, Tau Beta Pi, Sigma Phi Epsilon, Bkyln. Chamb. Comm. Hobby: athletics. Address: Davies Nitrate Co., Inc., 57-59 Commerce St., Brooklyn, N. Y.

Mees, C. E. Kenneth, director Research Laboratory, Eastman Kodak Co. Born, Wellingborough, Northamptonshire, Eng., 26 May 1882; mar., Alice Crisp, Croydon, Surrey, Eng., 1 June 1909; children, 1 son, 1 dau.; educat., Kingswood Schl., Bath, Harrogate Coll. and St. Dunstan's Coll., Catford, Eng., London Univ. Coll., B.S., 1903, D.Sc., 1906, Univ. Rochester, Hon. D.Sc., 1921. Wratten & Wainwright, Ltd., Croyden, Eng., mng. dir., 1906; Eastman Kodak Co., Rochester, N. Y., dir. Res. Lab. 1912, dir. Development, 1918, dir., Eastman Kodak Co. Publications, "Photography of Colored Objects," 1909; "Atlas of Absorption Spectra" 1909; "The Organization of Industrial Scientific Research," 1920; "The Fundamentals of Photography," 1920. Part author, "Investigations on the Theory of the Photographic Process," 1907. Assoc. Editor, Journal Franklin Inst. Memb., London Chem. Soc.; Amer. Chem. Soc.; Amer. Inst. Chem. Eng.; Royal Photographic Soc.; Fellow Amer. Assn. Adv. Sci.; Amer. Physical Soc.; Amer. Astronomical Soc.; Opt. Soc. Amer.; Soc. Motion Picture Engs. Clubs: Chemists', (N. Y.), University (Rochester, N. Y.). Address: Eastman Kodak Company, Kodak Park, Rochester N. Y.

Stuart, Kenneth E., research engineer, Hooker Electrochemical Co. and president, Stuart Research Engineering Corp. Born, Newark, N. Y., 26 May 1876; mar., Edith Crosby Brown, London, Eng., 7 Dec. 1912; educat., Cornell, M.E., 1897. Pneumatic Transit Co., Phila., engr., 1897-1908; Internatl. Pneumatic Tube Co., Phila., chem. engr., 1908-18. Designed automatic control for Post Office Railway, London, Eng. Memb., Natl. Res. Council, Union League (Phila.), Inst. Chem. Engrs. (London), Amer. Soc. Met. Engrs. (N.Y.) Clubs: Merion Cricket (Phila.); Niagara (Niagara Falls, N. Y.), Penn Ath. (Phila.) Hobby: aviation. Address: Hooker Electrochemical Co., Niagara Falls, N. Y.

SOLID CARBON DIOXIDE

Modern Scientific Research, in Developing the Efficient Utilization of this Chemical as a Refrigerant, has Founded a New, Rapidly-Growing Industry.

By J. D. Small

Vice-President, Dry Ice Corp. of America

THREE raw materials Nature supplies in the greatest profusion—water, air and carbon dioxide. On the latter, within the short span of five years, a new industry has been founded and has grown with spectacular speed.

Solid carbon dioxide has seized upon the imagination of the public to a remarkable degree. Of more practical importance, however, has been the almost immediate acceptance of this new chemical refrigerant by the older, established industries.

Possibly public interest has been attracted by the unusual qualities of solid carbon dioxide—its extreme cold, and the phenomenon of sublimation. Industrial acceptance, however, has not been based on novelty, but on the profits to be derived from its use. Solid carbon dioxide has made its way on its economic merit.

Solid carbon dioxide has been known for more than a generation. All efforts to utilize it, in the past, as an economical refrigerant were failures. Solid carbon dioxide, in subliming, will take up, absorb, approximately twice as many heat units as will water ice in melting. Its cost, however, has been, and still is, far more than twice that of water ice. The economics are obvious. Even the collateral advantages of solid carbon dioxide, dryness, reduced bulk and weight, were insufficient to overcome the obstacle of high cost.

Various unsuccessful attempts were made to substitute, economically, solid carbon dioxide for water ice in standard refrigerating structures. The results were invariably the same, one pound of solid carbon dioxide replaced approximately two pounds of water ice.

The efficient use of solid carbon dioxide as a refrigerant is a direct result of modern scientific research. The discovery was made that by making proper use of the CO_2 gas sublimed from the solid carbon dioxide, in addition to the heat absorbing property of the solid itself, a pound of solid carbon dioxide could be made to do the refrigerating work of ten, fifteen, even twenty or more pounds of water ice. Important among the methods so discovered was a way of utilizing the CO_2 gas itself as dynamic, moving insulation. Important among the results has been the realization that the value of a refrigerant is measured not by the hear units it will absorb, but by the refrigerating work it will do.

These new methods of using solid carbon dioxide have been adapted to, and embodied in, many types of refrigerating structures. A vast amount of commercial research has been required in order to introduce the structural variations, slight or great, made necessary by the individual peculiarities of specific products. The wide range of existing commercial uses is indicated by the illustrations forming a part of this article.

While solid carbon dioxide has been, up to this time, primarily a transportation refrigerant it is now rapidly taking its place in the field of stationary refrigeration also. For example, extremely moderately priced containers are now available. Thousands of small merchandising outlets, which have never before been able to afford the somewhat expensive refrigerating equipment necessary to maintain low temperatures, can now sell frozen fruits, fish, meat, ice cream, etc. refrigerated in such containers with solid carbon dioxide. By this means wide new markets have been opened up.

Solid carbon dioxide has made it possible to bring refrigerated products out of the ice-box, up from underneath the counter, into full view of the purchaser. Each such refrigerator is a silent, but highly efficient, salesman.

In the field of transportation refrigeration, solid carbon dioxide has a most important place. It is uniquely fitted for this work. In the meat, fish, and

Bringing the refrigerated product into full view of the purchaser and making it possible for increased handling of refrigerated products by retailers formerly unable to do so.

ice cream industries, the new refrigerant is widely used in trucks, truck boxes, package and barrel shipments.

The use of solid carbon dioxide reduces the per mile cost of truck operation and in addition effects intangible savings. For example, it cuts the loading time in half, reduces body weight and size considerably, effects a complete elimination of corrosive brine dripping, greatly prolongs the life of body and chassis, and reduces the cost of maintenance. The direct money saving, exclusive of the intangible savings listed above, over water ice and salt, on a 500 gallon ice cream truck amounts to not less than $5.00 per 60 mile day.

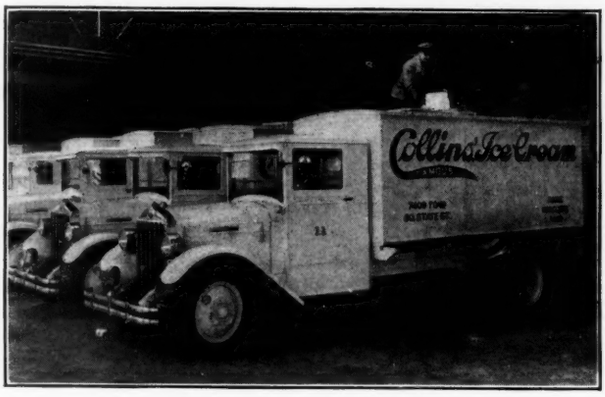
The majority of the ice cream manufacturers in the East are increasing their shipping trade, and the profits therefrom, through the use of solid carbon dioxide. The remarkable combination of a light

Airplane refrigeration with solid carbon dioxide. Fish from Mexico shipped via plane into Texas.

weight can, corrugated paper box, and solid carbon dioxide has eliminated most of the difficulties of ice cream shipments.

In the meat industry similar advantages and similar savings are obtained. In addition the carbon dioxide has a very beneficial effect on meat, retains the "bloom", and reduces loss through shrinkage. It must be understood that in all these uses any desired temperature, either above or below freezing, can be maintained if desired.

At the start of this article it was stated that Nature has provided three great raw materials in abundance. Water and air are normally found in a relatively pure state. CO_2, unfortunately, is almost always found in an impure state, that is, as one of the constituents in a mixture of gases. In the combustion of ordinary fuels, for example, such as coal, natural gas, etc., the percentage of CO_2 in the exit gases is seldom more than 12 per cent. It is expensive to recover pure CO_2 from such gaseous mixtures. In fact it is so expensive with ordinary power costs, that only in rare instances can such CO_2 be recovered economically. On the average any gas containing less than 17 per cent of CO_2 is outside the economic range and cannot be utilized, under present commercial methods of re-



Fleet of modern trucks designed to meet the use of solid carbon dioxide in the field of transportation refrigeration.

covery, in competition with gases containing a greater percentage of CO_2.

Even those gases in which the percentage of CO_2 is materially higher than 17 per cent can seldom be utilized as sources of commercial CO_2. There are problems of odor removal, dust, continuity of operation, cost of power, accessibility to markets, etc. One of the most important of these is continuity of operation for it is obvious that the source of the gas must be kept in continuous operation if the demand for the solid carbon dioxide is to be met. The condition becomes of paramount importance when the demand for the primary product is low. Among this class of CO_2 sources are lime kilns, cement plants, etc A few such sources can be utilized, by far the great majority cannot.

The three major factors in the direct cost of production of solid carbon dioxide are power, labor, and water. Fixed charges are comparatively high. The plant cost per daily ton of production is considerably lower in large plants (50 tons per day and above) than in small plants. Labor costs per ton are much lower in the large plant than in the small. Experience indicates that a plant having a capacity of less than ten (10) tons per day is unsound from a cost standpoint.

The standard method of producing pure CO_2 remains the coke process. High quality coke is burned under boilers. A portion of the CO_2 in the exit gases is absorbed by a sodium or potassium carbonate solution. The bicarbonate so formed is boiled and pure CO_2 is driven off, the regenerated carbonate being recirculated through the absorbing towers. The steam generated by the boiler, which may be considered as a by-product, gives sufficient power for primary liquefaction of the CO_2 gas.

CO_2 From By-Product Gases

By-product gases, such as those mentioned above, are ususally processed in much the same way, as in the coke process. Obviously the power required for primary liquefaction must be purchased, whereas in the coke process it is a by-product and free. The higher CO_2 content (30 per cent perhaps as compared with the 17 per cent—18 per cent encountered in the coke process) in a few by-product gases permits a somewhat reduced size in absorbing equipment with consequent moderate savings in first cost, fixed charges and secondary power.

Against this saving must be counter-balanced the extra cost of primary power, any extra costs of odor or dust removal, and in addition the cost of transportation from the by-product source to the market. The standard coke plant is, of course, located where desired, usually as close as practicable to the market to be served.

From the foregoing it will be evident that a careful engineering investigation, followed by an intelligent analysis wherein all pertinent factors are considered and given proper weight, is required in any specific locality before a decision is reached to utilize by-product gas rather than the coke process.

The solid carbon dioxide industry by its very nature is highly seasonal. Expensive equipment must be built to meet the high summer demand and, in great part, left idle during the long off-peak winter season. Increased costs are a direct result.

Since solid carbon dioxide is approximately 110°F. below zero, heat is constantly and rapidly flowing toward it. Storage of solid carbon dioxide is therefore expensive. There are many problems involved in the handling of this highly perishable product between the time that it is manufactured and the time that it is delivered to the customer. On the solution of such problems may well depend the difference between profit or loss. In few industries is practical knowledge so controllingly important as compared with laboratory or theoretical skill.

Solid carbon dioxide seems destined to be a great industry. On it those industries handling perishable products are depending more and more. New and profitable merchandising methods are being devised around it. New and profitable merchandising outlets are being opened up, because of it. Its future seems secure.

German Potash Prices Too High in View of Increased Production

German potash industry has developed to a point warranting a reduction in prices, as large increases in production during the past year were accompanied by only slight increases in expenditures, and the unit cost of production declined considerably. The report of the committee appointed by the German Government to investigate the potash industry states that the known deposits of potash are ample to cover the German demand and leave an important exportable surplus for many hundred years to come.

The tendency for rationalization in industry, which found expression in the potash laws of 1910 and 1921, resulted in the decrease in the number of active mines and works and the increase in output per mine. Especially important were the effects of the law of 1921, which provided for closing works not being operated economically and prohibited the sinking of new shafts. In fact, only since 1921 has concentration made substantial progress in the potash industry. Between 1912 and 1921 the number of mines increased from 116 to 205, despite the loss of 13 Alsatian mines.

The average content of pure potash in the output of German works was raised from 10.3 per cent in 1921 to 13.3 per cent in 1928. Although this policy resulted in restriction of various by-products, which were especially numerous in the case of carnallite salts, the total value of by-products increased from 4,000,000 marks in 1913 to 12,200,000 in 1927. Fuel consumption in potash works has been reduced from 330 kilos of brown coal per 100 kilos of pure potash in 1922 to 150 kilos of brown coal in 1928.

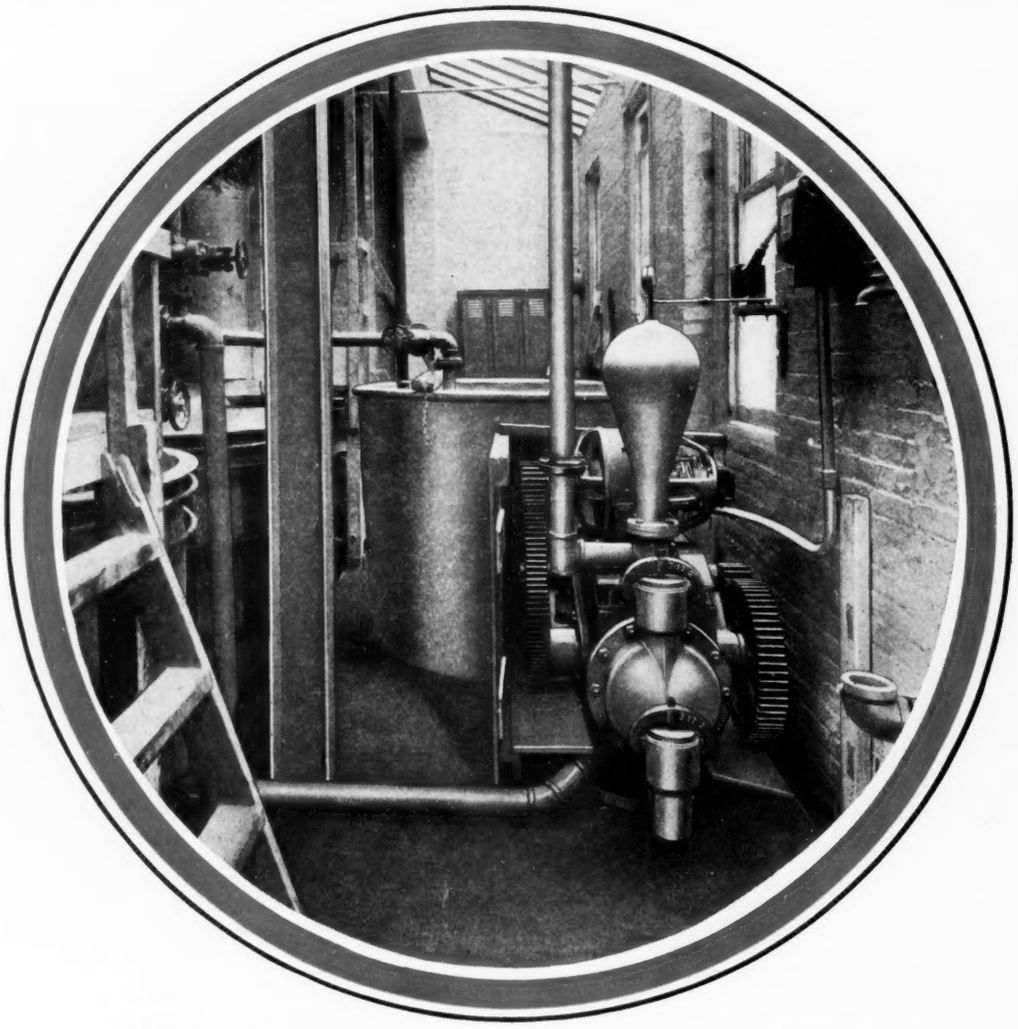
The total capital invested in the German potash industry at present is estimated at 1,400,000,000 marks, but the committee considers this figure incorrect since faulty investments often have caused considerable loss of capital. The current replacement value of the total investment is estimated by the committee at between 600,000,000 and 700,000,000 marks. (Mark = $0.2382 at par.)

An investigation by the committee of 18 groups, accounting jointly for 57 per cent of the total output, revealed that the total costs of production, for the most part were independent of the volume produced. In other words, retrenchments in output are not accompanied by a corresponding decrease in expenditure. Furthermore, the large increase in production during recent years resulted in only a slight increase in expenditure, whereas the cost of production per unit of output declined very considerably, despite the advance in wages and prices of materials.

The cost of labor per 100 kilos of pure potash declined from 3.61 marks in 1926 to 3.20 in 1928 indicating that the wage advances were more than outweighed by increased production. Figured n similar terms, the cost of social legislation decreased from 0.62 mark in 1926 to 0.60 in 1928 and the expenditure for taxes from 1.90 marks in 1926 to 1.12 in 1928.

The proportion of profits written off for reserve funds by various potash concerns varied greatly. The potash syndicate set down, in 1926, a norm of 3.26 marks per 100 kilos of pure potash as the necessary rate of reserves. On the other hand, the Kaliprufungsstelle, the board which fixes the quotas for potash concerns, at about the same time maintained that 2.18 marks per 100 kilos should be taken as the proper norm. The actual amount of reserves written off by 18 works investigated by the committee was 16,040,000 marks in 1926, 20,000,000 in 1927, and 29,400,000 in 1928.

Taking the medium estimate of investment at 350,000,000 marks as possibly accurate, and allowing for the higher norm of reserves as for 1927, the potash industry is thought to be in a position to reduce prices. It is pointed out that the rate of 15.9 per cent. of net profit is far above the average rate for German industry. Furthermore, reduced prices of potash doubtless would result in increased consumption, and, consequently, in an even more economical operation of potash works.



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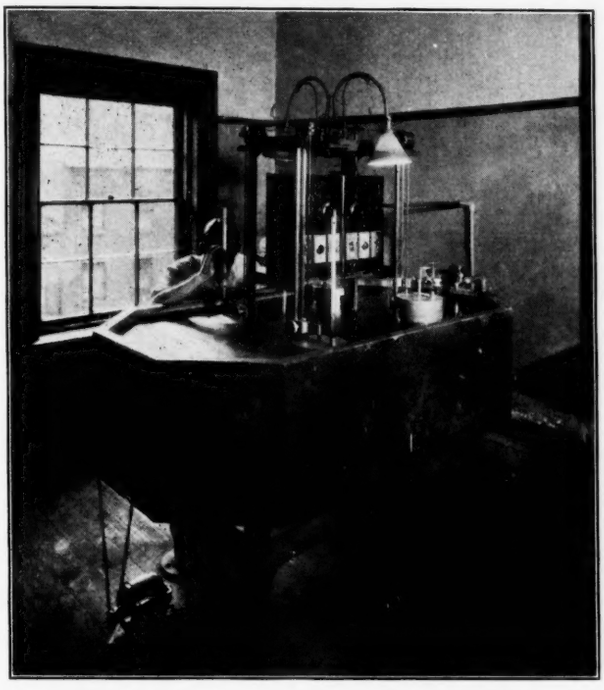

Calorimeter equipment for determining heat value (B.t.u.) of coal

Judging COAL Values

By Henry L. Brunjes

Assistant to the President, Fuel Engineering Co. of New York

IT is becoming increasingly important in our industrial life to purchase commodities subject to certain tests, so that these tests will indicate agreement with or variation from definite standards that are clearly understood by all parties concerned and that are applicable to the commodity in all parts of the country.

As coal is our greatest single source of energy and as such, is an item of major importance to all, it is easy to understand what an ideal advantage it would be to both consumer and producer if standards were attained that would be applicable to all coal, regardless where mined or consumed. For with these standards existing the purchase of coal would be simplified to the extent that certain symbols could be used to indicate within narrow limits the standard to which the coal must conform. But when we look at coal in the light of the definition—a substance widely occurring in nature, of varying composition and character, carrying with it various amounts of different impurities with which it is more or less intimately mixed—it becomes apparent that here is a substance not easily comformable to any classification or standards of commercial value.

Many attempts have been made and are being made to-day to establish commercial standards for the various types of coal, but up to the present time none have come into anything like general use. This is not only due to the complexity of coal itself but to the immense amount of unsound tradition that surrounds both producer and consumer and to the still prevalent use of vague designations that tend to confuse, rather than explain to the user, the origin and type of the coal in question. As the process of clearing away the traditions and discontinuing the use of meaningless designations appears to be a long one, the consumer is faced with the necessity of having to establish his own standards by means of coal tests. This method has a weakness in that to form an opinion of the worth of a coal it is necessary to have a knowledge of the commercial characteristics of other coals of the same origin, for coal tests, without a number of other tests on coals of like character, are practically worthless from a commercial point of view. When we realize that coal is subject to innumerable variations with a particular bed or seam and that in a mine itself the coal varies from time to time, the problem becomes more complicated, for it is unlikely that the average consumer could afford to set up an organization for the single purpose of studying coal characteristics and variations throughout the entire producing regions, just to insure himself the ability properly to classify and evaluate his fuel.

One of the things the consumer may do to aid materially in the proper interpretation of a coal test is to familiarize himself with the various broad types into which coal is usually classified and from the data given in the following discussion of the various items

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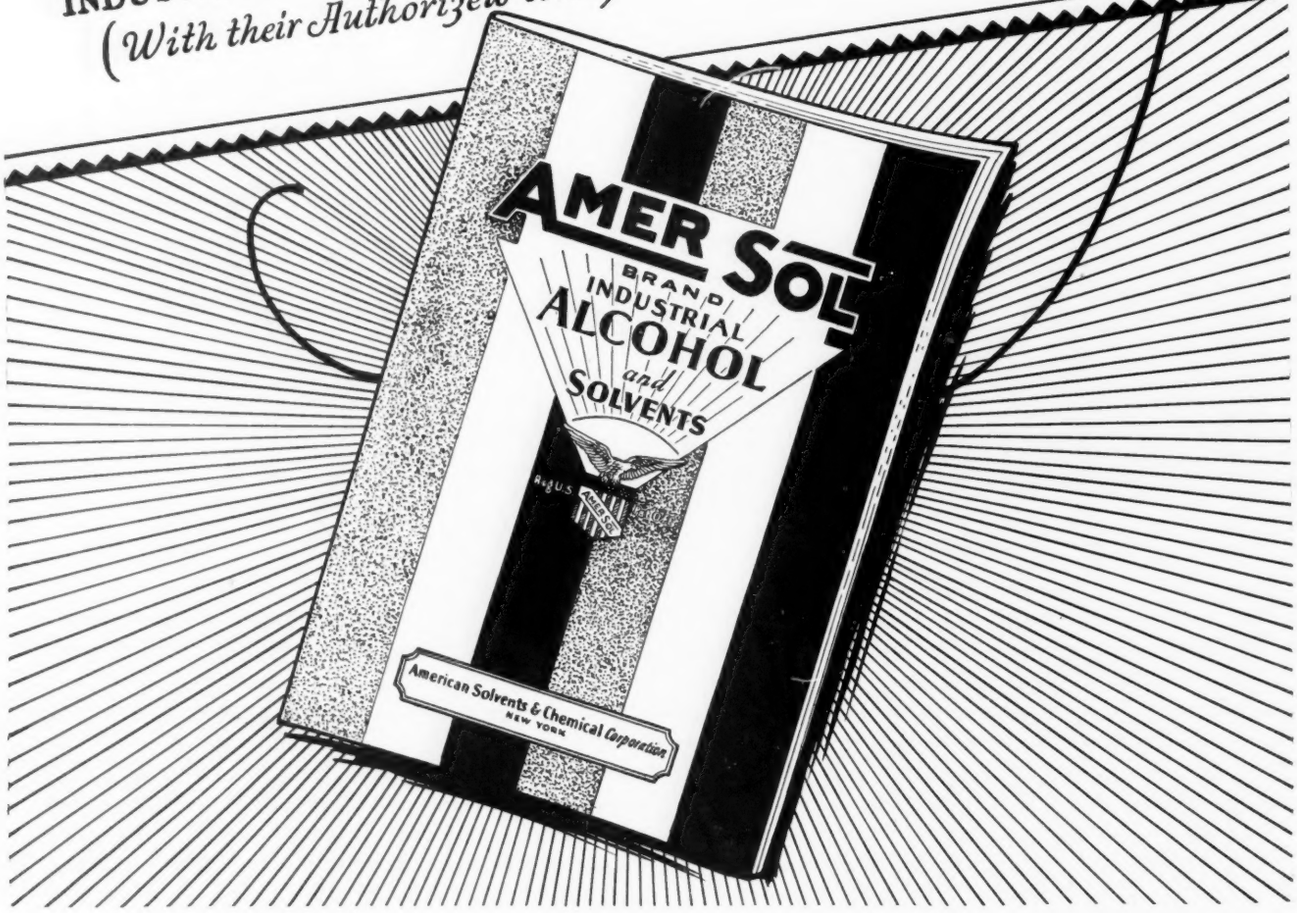

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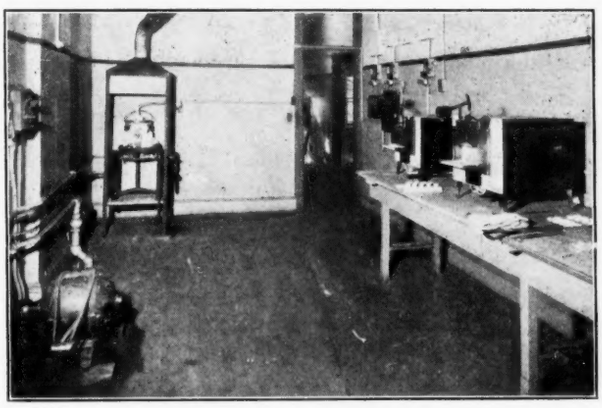
of the coal test get a somewhat general ideal of the commercial characteristics of these coal types. The figures that will be used in this discussion represent delivered quality and are not based on mine or prospect samples. Mine or prospect samples, while of interest to the miner or geologist, are of little value to the consumer for they usually tend to give a distorted conception of the quality of the coal. It would be well to remember that the figures quoted are not to be considered as rigid limits of coal qualities, but rather as an indication of what can be expected of the various types in a commercial way. When so considered they should be quite accurate during normal coal market conditions. When coal market conditions are upset coal qualities usually become somewhat erratic.

Coal is usually classified according to its geologic rank starting with peat, which is the first step in coalification, progressing through lignite, sub-bituminous, low rank bituminous, bituminous, semi-bituminous, semi-anthracite, anthracite to the graphitic types. These classes are not always definitely defined as the various types often overlap in one or more of their characteristics. As these overlapping or "line" coals are exceptions they will, for the purpose of simplicity, be disregarded and for the same purpose only the three most commercially important types of coal will be considered. These are the low rank bituminous, bituminous and semi-bituminous. While anthracite occupies an important place it presents a somewhat different problem than the bituminous coals and will only be mentioned briefly. Rather than use the term low rank, coals of this type will be referred to as mid-Western field bituminous, for the term low rank, while it may be correct, is quite apt to indicate an inferior fuel to persons unacquainted with these coals—which would be somewhat untrue.



Electric and gas furnaces used in determining volatile and ash, and fusing temperature of ash. All temperatures are constantly indicated electrically.

While there are a great many tests that can be applied to coal to classify it scientifically and to establish its worth commercially, the greater number of them are of importance chiefly to the fuel technologists and are of such nature that consideration of them by the average consumer would prove to be both expensive and burdensome. The relatively rapid and inexpensive method that is used to-day to evaluate coal is known as the proximate analysis and is no doubt well known to most consumers. While this test does not indicate everything that may be desirable to know about a coal, it can, when properly interpreted and compared with other like tests, be used to furnish a reliable basis on which to judge the relative worth of various coals. The proximate analysis determines the amount of moisture, ash, volatile and sulfur present in the coal. The determination of the British thermal units, while not strictly a part of the proximate is usually considered as such because of its almost indispensable value. The same may be said of the determination of the fusing temperature of ash, which is coming into greater regard right along. All of the items of this proximate are of practically equal importance and all should be considered when judging coal values.

Two Types of Moisture

Moisture is an item to be considered in that it is an inert material that requires a certain amount of heat to dispose of it as steam when the coal is fired and aside from this when coal is loaded at the mine moisture is always present to some degree and will be purchased at coal prices. Moisture is present in all coal and may be considered to be of two types, the inherent or textural moisture and the extraneous moisture. The first is a function of the geologic age and is beyond control of the miner to regulate and must be expected in coals originating within that particular group. The second or extraneous type is due to weather conditions during transit, which of course are uncontrollable, the condition of the mine, whether wet or dry, wetting the coal for the purpose of rendering it less dusty and water from wet cleaning processes. The last two causes of wet coal are controllable but unfortunately the amount due to these causes is almost impossible to determine but may be indicated by an unusually high moisture content running rather uniform over long periods. As to what may be expected in the way of moisture contents in the three types of coal under discussion may be seen by noting, in the following figures, the normal moisture range and what may be considered a fair average over a long period of time.

Class or Type of Coal	*Normal Range*	*Average*
Mid-western field bituminous.	5 to 16%	11.0%
Eastern field bituminous	2 to 6%	3.5%
Low volatile bituminous.	2 to 5%	3.0%

The moisture content of anthracite usually varies according to the sizes prepared, the largest sizes averaging around three or four per cent and the smaller around six or eight per cent.

The ash content of a coal is the one impurity whose presence depends a great deal upon the care and responsibility shown by the producer. It is somewhat in the class of moisture in that it is an inert material

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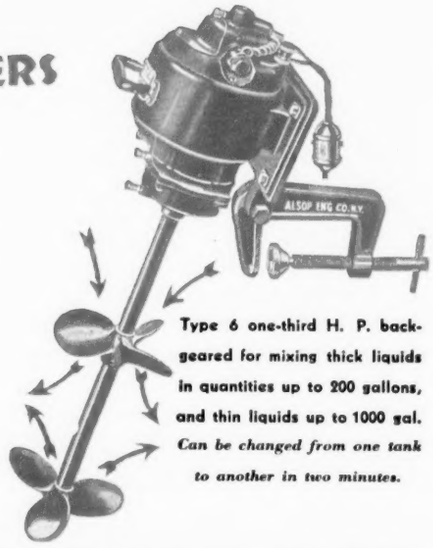

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and is always present to some degree in all coals. The ash is from two sources which may be termed inherent and adventitious. The inherent ash is intimately mixed with the coal substance and is impossible to separate commercially. It is mainly due to the inorganic matter of the plant remains that went to form the coal substance. This ash is usually small in amount and somewhat insignificant in comparison with the amount due to the adventitious source. The adventitious ash is the mineral matter of the slate or bone partings, iron pyrites or any rock intrusion in the coal bed, that when the coal is mined will be present and be more or less intimately mixed

Where coal samples are crushed, pulverized and prepared for testing in the laboratory of the Fuel Engineering Co.

with it. It is usually possible to remove the greater part of these impurities by various means ranging from hand picking to elaborate mechanical devices that depend upon differences in gravity to effect a separation. From this one can easily realize how much depends on the ability of the operator to remove these impurities to assure the consumer a clean product. As the greater part of the ash in delivered, coal depends on either human means or some mechanism, it is difficult to indicate with accuracy what might be termed a reasonable ash content. This difficulty is partly overcome by the trend of consumers to demand low ash coals which results in the closing down of the poorer mines and narrows the limit of ash in merchantable coals. In determining what is reasonable in ash content it is more reliable to base an opinion on an average figure rather than the high or low in normal range, for all coals within this range have a definite place in industry and while it may be desirable it is not always a necessity for the buyer to restrict his purchases to only include coals of almost low normal limit ash content. This range of ash in delivered coal can be shown by the following figures. These figures are on the basis of "dry coal" to compensate for differences in average moisture.

Class or Type of Coal	*Normal Range*	*Average*
Mid-western field bituminous...	6 to 17%	12.5%
Eastern field bituminous.....	6 to 14%	11.0%
Low volatile bituminous.....	5 to 12%	9.5%

Ash in anthracite coal usually follows the sizing, the large and small sizes being the lowest in ash while the intermediate sizes run somewhat higher. This is only partly true for a great deal depends on the fracture of the coal. For this reason no figures can be given that would be even approximately true of all anthracite.

Volatile a Fundamental Difference

Volatile is the one chief characteristic of coal that runs comparatively uniformly throughout the various coal fields and furnishes the means of detecting the fundamental differences between coals. It is the incomplete combustion of this portion of the coal that causes smoke. Coals in the high volatile ranges are often called "smoky" coals. This is somewhat erroneous for these coals can be burned without smoke under suitable conditions, while it is quite possible to have smoke difficulties with the so-called low volatile smokeless coals. Smoke troubles often hinge on other things besides the amount of volatile. To mention a few—even distribution of air through the fuel bed, space enough over the fire to allow a complete combustion before the hot gases are chilled by coming in contact with the tubes, composition of the volatile in regard to the amount of tarry hydrocarbons present and neglect to realize that all coals do not behave the same when fired. The volatile (exclusive of water), while its constitution is variable, is composed chiefly of methane and various other hydrocarbon, hydrogen, carbon monoxide and dioxide, oxygen and in some cases a water of hydration of shaley matter in the ash. It is due to this variable composition that the heating values of coals differ within their particular types, for if the composition of the volatile followed a definite rule the determination of the heating value would be a matter of mathematics rather than calorimetry. The differences in heating value of coal types can be shown by listing the volatile ranges of the types under discussion and giving to each what might be called a normal heat value according to the amount of ash.

Class or Type of Coal	*Normal Volatile Range*	*Ash Content*	*Heating Value*
Mid-western field bit...	30 to 40%	10%	13200
Eastern field bit.....	26 to 40%	10%	13700
Low volatile bit.....	15 to 26%	10%	14100
Anthracite.....	3 to 10%	10%	13400

Sulfur, even though it adds a certain amount of heat to the coal in burning, should be considered an undesirable element of coal for its troublesome qualities far outweigh this possible advantage. It is present in coal in three forms, combined with iron as iron pyrites, as a sulfate and in organic combination with the coal substance. All three of these forms are likely to be present. Iron pyrites is the most common form and possibly the most undesirable, not only from the point of view of sulfur but in that it contributes iron in a form that is conducive to clinker formation. To just what extent this occurs depends largely on the

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AROCLOR 4265. A light-yellow product similar in properties to AROCLOR 2165. This material is soluble in nearly all organic solvents, including carbon disulfide, furfural, pine oil, petroleum turpentine, linseed and tung oils, phenol, benzene, toluene, etc., being more soluble in aromatic solvents than in esters. It is stable against 10% boiling alkali.

The properties of AROCLOR 4265 suggest its use as a varnish gum, an ingredient of condensation products, a plasticizer, an insulating material, a flame-proofing medium, a water-proofing agent, a binder for plastic materials.

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composition and amount of ash present. Regardless of possible clinker trouble sulfur burning to sulfur dioxide (with the possibility of sulfur trioxide being formed) and being spread through the atmosphere over the country side has a noticably bad effect on the life of metals and textiles, to say nothing of its effect on the human system; all of which makes it an element that should be kept at a minimum. The amount of pyritic sulfur in delivered coal quite often depends on the care used by the miner for when it occurs in heavy layers or pockets in the coal seam it is quite noticeable and can and should be discarded. When it is intimately mixed with the coal in the form of thin bands or small nodules it is difficult to see and its removal must depend on some mechanical cleaning or washing system. The amount of sulfur present in coal follows no particular type or class of coal as it varies from one-half to six per cent throughout practically all of the bituminous fields. Anthracites have but little sulfur, it rarely being present in excess of one per cent.

B. T. U. a Positive Index

The determination of the British thermal units or heating value is the one positive index of value, in that regardless of other characteristics, heat is being purchased and the amount of it delivered indicates whether or not you have received your money's worth. There is no certain way of calculating the heating value of a coal from the items of the proximate for even coal from the same mine will vary in this respect while its other characteristics may remain quite constant. This is due to the oxidation of some portion of the heat producing elements. Weathering, an important cause of coal oxidation, is sometimes indicated by the proximate but no indication of how far it has progressed. For this reason it is necessary to depend on the calorimeter for the accurate determination of the heating value. Even though the calorimetric determination requires an expensive installation and expert manipulation it is easy to see what an extremely worth while determination it is and without which how difficult it would be accurately to judge the value of the coal.

The fusing temperature of ash and its relationship to clinker formation is a large subject, and consequently only a few of the more pertinent facts regarding it will be mentioned. The fusing temperature of most coal ash is between 1900° and 3,000° it being rare to find an ash fusing outside these limits, especially the higher. The fusing temperature of ash is generally indicated as being within a high, medium or low range. These ranges are usually considered with the following limits.

High	*Medium*	*Low*
Over 2600°	2400 to 2600°	Below 2400°

When we consider the fact that some plants can burn a coal with a low fusing ash at rather high ratings without clinker trouble, while other plants must have a coal with an ash fusibility of over 2,700° to eliminate possibility of clinker, it becomes apparent that clinker is due more to a combination of circumstances rather than to the fusibility of the ash. For this reason the fusing temperature of the ash must be taken as a clinkering index only when we take into consideration the conditions to which the coal will be subjected and to some extent the character of the coal. Fortunately not all clinker is troublesome but this is a fact difficult to predetermine and must be a subject of experimentation in the boiler room. Some of the causes of clinker, other than low fusibility of ash, that should be considered in setting a limit of ash fusibility in the plant, are the amount of coal burned per square foot of grate surface per hour, the sizing of the coal upon which depends the evenness and ease of gas paths through the fuel bed, coking characteristics that are likely to interfere with an even air supply and the presence of excessive amounts of adventitious ash and also the possibility of this adventitious ash becoming segregated in small islands.

Value of Regular Analyses

As a last word in speaking of the value of coal analyses it would be well to bear in mind a statement made by the Bureau of Mines in one of their bulletins which says in part: "In using analyses of delivered coal it must be recognized that the coal is not always of uniform size and that the impurities are not uniformly distributed throughout the mass. Results, therefore, will vary somewhat, and even though the same mass of coal be sampled a number of times, the analyses will not agree absolutely except by chance. It is only when a large number of analyses representing a considerable tonnage mined over a period of time are available, that the average value and range of variation of a particular coal become known with assurance. With reasonable tolerances for these variations, delivered coal can be sampled accurately enough for all practical purposes. Delivered coal from any given mine may vary from day to day, due to variations in mining or preparing the coal; hence a record of analyses of delivered coal for any one time should not be considered as a permanent record, for the output may be greatly improved by the use of new methods at the mine or, on the other hand, it may deteriorate through the carelessness in mining and preparation."

Carbide & Carbon Chemicals Corp. plans construction of plant on Blaine Island, Near Charleston, W. Va., to manufacture synthetic alcohol. New plant unit to consist of four buildings will cost about $1,780,000 according to reports.

Waukegan Chemical Co., North Chicago, plans construction of one-story addition to factory to cost about $45,000.

National Pigments & Chemical Co.'s St. Louis plant is completely rebuilt and now in operation.

WHEN A CUSTOMER BEGINS TO SWEAR!

IF YOU know it, you start looking for the trouble. If you don't know it, the customer is lost, and you can't defend yourself.

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Think carefully about your containers. Remember, the customer's only knowledge of your product depends on its quality *when he starts to use it.*

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Your sales department will appreciate the appearance of Carpenter Drums—and their display opportunities. Your customers will appreciate their ease of handling and opening—their convenience while in use.

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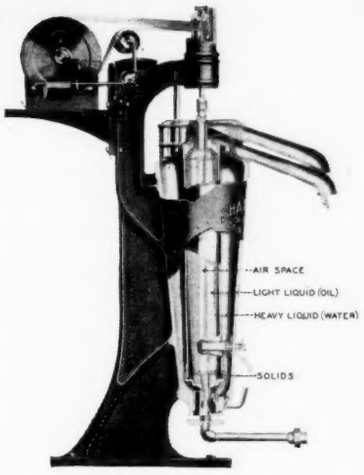
Products..... Shipped by .....
(Chemicals, Oils, Etc.) (Barrels, Bags, Boxes, Metal Drums, Etc.)



Applying Centrifugal Force *in* Chemical Production

By E. M. James
Sharples Specialty Co.

UNTIL comparatively recent times, the centrifugal force developed by commercial machinery amounted only to a few hundred times gravity. Now modern centrifugals have been placed on the market which will develop a force of some 15,000 times the force of gravity. This tremendous force has found application in cases where gravity settling or ordinary filtration have proved impossible.

Sometimes emulsions are met with in which the constituents will putrify or decompose if the action of gravity is awaited. Such emulsions can frequently be resolved continuously into their component parts by passing through the rotor of a high speed centrifugal. Other emulsions, on account of viscosity, or of the presence of small quantities of finely divided solids which stabilize the suspension of one liquid phase in the other can only be resolved by gravity with the expenditure of huge quantities of steam and the provision of large tanks. These refractory emulsions are often readily resolved by passage through the centrifuge, with the added advantage that any suspended solids are simultaneously recovered.

Greater Recovery Value

In certain industries where the bulk of two immiscible liquids will settle rapidly and separate by gravity an intermediate emulsion layer remains which must be wasted. By subjecting this intermediate layer to high centrifugal force, it has been found possible not only to recover the greater part of the valuable constituents, but to produce a water effluent which will not cause stream pollution.

Turning to the question of solids suspended in a single liquid, where the solids are of such a nature that they will filter only with great difficulty or not at all, the high speed centrifugal will usually effect satisfactory clarification.

The manager of a chemical plant will be confronted with many problems which can be economically and easily solved by the installation of high speed centrifugals. If such a manager be wise, he will bear the foregoing in mind, and when faced with such a problem, he will consult with the maker of centrifuges. The latter, out of his previous experience, will frequently be able to recommend the proper equipment. In doubtful cases, it is usually better to submit a sample of the material to be treated direct to the centrifugal manufacturer, who can then have the material processed in his laboratory and advise whether a centrifugal will offer a satisfactory solution for the problem in question.

Centrifugals are operating successfully on the clarification of the following substances: benzol, carbon tetrachloride, creosoting oils, ethyl alcohol, glycerine, lactose solution, mercury, oxalic acid solution, orthotoluidine, rubber accelerator, sodium hydroxide solution, sulfonated oil, solutions of zinc chloride.

Various Applications in Industry

Citation of a number of present uses of centrifuges in industry will be given here in order that the reader may better picture the types of applications that can be successfully and profitably handled by them.

In printing the color designs on leather, a paste or gum is used to hold the color and prevent it from running. The paste is mixed with the color and applied to the leather from copper rolls. It is prepared by extracting certain species of shrubs, and in a crude form is likely to contain woody fibres. If these shreds of wood are not removed from the paste, the dye would show in streaks, and the copper rolls might be blemished. Such a product would be difficult to filter, but is easily clarified with the centrifuge. The centrifuge discharges continuously a clarified paste, removing the dirt, sand, and shreds of wood. A similar paste is used for printing patterns on textiles, and centrifuges are also used for its clarification.

Centrifuges are used for the clarification of fuel oil used in the manufacture of glass bottles. Uncentrifuged oil contains a small percentage of tiny black particles. When the oil is burned such particles form incandescent "sparks" which fly into the glass, causing defects in the bottle. All particles which might

Acetone
Acetone Oil
Ammonium Nitrate
Calcium Acetate
Carbon Black (Crow Brand)
Cellulose Acetate
Decolorizing Carbons
Diacetone Alcohol
Formic Acid
Lamp Black
Methyl Ethyl Ketone
Sodium Acetate
Sodium Sulphide
Triphenyl Phosphate

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Standard Quality

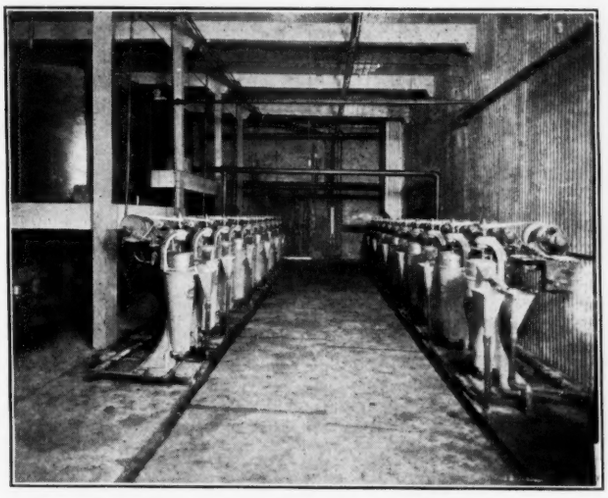
cause "sparks" are removed by a centrifuge, and a perfect bottle is produced. Centrifugal treatment also makes possible the use of heavier fuel oils, which are cheaper. Clogging of pipe lines and burners which formerly precluded the burning of such oils is completely eliminated.

The clarification of baking enamels used by manufacturers of automobile bodies is being handled very successfully by centrifuges. The body parts are dipped, and dust and other speck-forming particles contaminate the paint. The used enamel from the dipping vat is reconditioned by the Centrifuge, coarse foreign material being removed without disturbing the pigment. The process has invariably resulted in a reduced cost for a smooth, brilliant finish. In a typical plant but one-half of the labor formerly required in rubbing is needed.

By the centrifugal treatment of the broth culture containing bacillus acidophilus, it has been found possible to recover over 98 per cent of the contained bacilli in the form of a paste, which is readily worked into the desired product.

Although this is a special application of high centrifugal force, nevertheless, it will enable the reader to visualize the extremely minute suspended solids which may be thrown out when subjected to high centrifugal force.

A machine has recently been developed for the dehydration of ammonium sulfate crystals. By a slight change in design it has been possible to increase plant capacities by approximately 13 per cent, and at the same time yield a satisfactory product with one centrifugal treatment.



Battery of centrifuges used in the recovery of vegetable oil from soap stock in the plant of the American Cotton Oil Company.

The presence of small amounts of water and impurities greatly accelerates the deterioration of fatty oils. The result is the production of free fatty acids with consequent unpleasant flavor. This is often accompanied by undesirable bacterial action. The dehydration of butter oil is typical. Butter oil containing over 0.11 per cent moisture does not keep well unless preserved. Butter oil separated from butter or cream oil and dehydrated with the centrifuge may be sealed in cans and kept indefinitely without losing its flavor or otherwise deteriorating.

The centrifugal dehydration improves upon gravity in two important respects. It greatly increases speed of separation. It secures more complete recovery of the dehydrated product. Viscous liquids require elevated temperatures if separated by gravity. Prolonged application of heat is costly and frequently leads to evaporation of volatile constituents and injury to the product. With the centrifuge, heating need by only long enough to bring the liquid to the temperature desired for separation.

View of a solvent portable centrifuge used in the clarification of lacquer.

Oils for electrical transformers must be maintained to a high degree of purity. To be considered a safe insulating and cooling medium, such oil must withstand an E. M. F. of 22,000 volts applied across 1″ discs placed 1-10″ apart. The centrifuge delivers a satisfactory, high test oil.

Previous to the advent of the centrifuge for the dehydration of water gas tar, the mixture of tar and water accumulated in the bottom of the gas holder. Gravity separation made possible the recovery of some dry tar and free water but between the tar and water layers there accumulated an emulsion. In time, this emulsion filled the holder. It was neither salable nor burnable and was necessarily wasted. The centrifuge in this case offers the only satisfactory solution. The tar is fed from the holder to the centrifuge. There is no accumulation of emulsion. The tar is run direct to storage and the water wasted without causing pollution of streams or clogging sewers. The tar is thus made a valuable by-product.

The clarification of lubricating oils for all types of machinery—Diesels, Compressors, Turbines, Machine Tools, (Cutting Oils), etc., etc.,—provides one of the most wide spread and profitable uses of centrifuges.

The
Pennsylvania
Salt Manufacturing
Company

of Philadelphia

announces the purchase of the process and plant for the manufacture of

Ammonium Persulphate

formerly owned by
The North American Chemical Company,
Bay City, Michigan

This equipment has been transferred to their Wyandotte, Michigan plant, and is now being operated in charge of the people formerly at Bay City.

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WE can supply you with Lacquer Diluents in quantity and quality! They will measure up to your strictest specifications and also effect a great saving for you over Toluol or Benzol. Your production needs can be better for it! If you are anxious to provide for a consistent supply of Lacquer Diluents, you will be wise to make inquiry immediately.

Our specialists developed these products and many others.

They are available now in quantity:

LACTOL—a special lacquer thinner for use as a diluent and a vehicle to carry the active solvent in the manufacture of lacquers; has the same evaporating time as Toluol; generally used by large manufacturers of lacquers who find it superior and more economical than Toluol.

TEXTILE—a thinner for use in replacing Benzol, and other coal tar solvents; has the same evaporating time as Benzol; widely used by large industries, artificial leather manufacturers, textile manufacturers, etc., as a substitute for Benzol; more efficient and more economical.

KEMSOLENE—a thinner for use as a diluent and a vehicle to carry the active solvents in the manufacture of lacquers; has an exceptional high flash.

AMERICAN MINERAL SPIRITS COMPANY

306 So. Michigan Ave.
Chicago

205 East 42nd Street
New York.

Piped into the oil system, the centrifuge draws used oil, removes moisture, coarse carbon particles, grit and sludge, and returns to the system a cleaned oil. The centrifuge is an automatic safeguard against the enemies of lubrication. The oil is always kept in good condition, for as soon as moisture, grit, or other undesirable matter finds its way into the lubricating system, it is immediately removed by the centrifuge.

Filtration has been found inadequate, as it does not remove the fine abrasives and does not remove moisture, and the majority of big power plants, ashore and on shipboard, have come to the use of centrifugals to safeguard against shut-downs and to decrease repair costs. When buying new oils, only absolute purity is tolerated; yet these oils are badly contaminated soon after their introduction into an engine. No matter what care is used in buying an oil, the engine is running on a dirty oil unless a centrifuge is continuously clarifying it.

Approximately 10,000 barrels of high viscosity lubricating oil are dewaxed daily in the petroleum refineries of the United States by the patented "Centrifugal Dewaxing Process". In this process the lubricating stock is first brought to the required degree of purity by treatment with sulfuric acid and neutralization, by clay circulation, or by contact treatment with fine clay and filter-pressing. The lubricating stock so treated is diluted with naphtha, using about two parts of naphtha to one part of lubricating stock. The mixture is then heated to about 100°F. to give a complete solution, and then is chilled to precipitate the wax. The chilled mixture is passed through a specially designed centrifuge which discharges dewaxed, diluted lubricating stock, and also continuously discharges the separated wax. It is thus possible to make viscous, paraffin base lubricants, which have cold tests that are comparable with those lubricants of similar viscosities produced from asphalt base crudes.

The manufacturing processes in which the centrifugal finds a ready application are numerous and over 200 additional uses covering clarifications and separations could be given to demonstrate the wide applicability of the centrifuge. There are also undoubtedly many valuable uses yet to be discovered where new qualities of product will be possible and new economies effected.

W. R. Eberhardt, for the past ten years structural engineer and contract engineer, H. K. Ferguson Co., Cleveland, is appointed manager of the company's New York office.

Mine Safety Appliances Co., Pittsburgh, issues new catalog No. 4 entitled "Everything for Mine and Industrial Safety". Copies furnished upon request.

Linde Air Products Co. issues booklet entitled, "Design Standards for Oxwelded Steel and Wrought Iron Piping". Copies are available upon request.

International Nickel Co. issues booklet entitled "Meeting the Metal Requirements of the Process Industries", containing data on corrosion.

New Plant Construction

American Cyanamid Co. is arranging preliminary plans for general expansion and improvement in a number of its plants in different parts of the country, including works of recently acquired companies in New Jersey and Pennsylvania. Work will include the construction of new buildings and installation of equipment; details will be determined at an early date. The company is carrying out a financing program, including the sale of new stock totaling $23,841,000, a portion of the fund to be used for the development noted.

Union Carbide & Carbon Co. plans construction of addition to Niagara Falls plant, to be one-story and cost about $75,000. Company's new Southern headquarters building at Birmingham, Ala., is nearing completion. The two-story brick structure is being erected at cost of $100,000.

Calco Chemical Co. plans construction of three one-story additions to Bound Brook, N. J., plant, consisting of manufacturing unit, distributing and storage unit, and boiler house, reported to cost in excess of $90,000 with equipment.

Ozark Chemical Co. is constructing another contact acid unit as an addition to its present sulfuric acid plant, at an approximate cost of $200,000. Engineering work is being done by Monsanto Chemical Co. and its vanadium catalyst will be installed.

Union Solvents Corp., Carthage, O., approves plans for plant extensions including new one-story unit, estimated to cost approximately $32,000 including equipment.

Eaton-Clark Co., Detroit, approves plans for one-story top addition to its plant to be used for storage and distributing and to cost over $40,000 with equipment.

Commercial Pigments Corp. approves plans for addition to Baltimore plant to be two-story, estimated to cost $30,000 including equipment.

Harshaw Chemical Co., Philadelphia, completes plans for new two-story factory branch reported to cost $80,000 with equipment.

Christian Hansen's Laboratory, Little Falls, N. Y., plans new branch plant at West Allis, Wisc., consisting of three-story and basement unit to cost about $80,000.

W. T. Rawleigh Co., Freeport, Ill., plans one-story plant addition to cost about $30,000.

Hilton-Davis Co., Cincinnati, plans multi-storied plant addition to cost about $100,000.

U. S. Stoneware Co., Akron, purchases five-acres site adjoining Tallmadge, O., plant to provide for future expansion.

Stauffer Chemical Co. is now producing at its new Roanoke, Va., carbon bisulfate plant.

Mixing Equipment Co., New York, is now in production at its new Rochester, N. Y., plant. In addition to its New York branch, the company plans to establish others at Chicago, San Francisco and Atlanta.

Swenson Evaporator Co., Harvey, Ill., issues bulletin entitled "Heat Transfer and Crystallization", being the seventh of a series on "Principles of Forced Circulation Evaporation". Copies will be furnished upon request.

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GRANULAR
CRYSTALS

SODIUM CITRATE
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Dead Sea Potash Production Uncertain Says British Report

Production of potash and other minerals from the waters of the Dead Sea is still in a rather uncertain state according to a report on the subject issued by a committee appointed in London by the British Government.

The summary of conclusions in the report reads as follows:—

"(*a*) (i) That, from the technical standpoint, as distinguished from the commercial, no insuperable difficulties are likely to be met with in connection with the extraction of potash from the Dead Sea in quantities of the order of 100,000 tons of potassium chloride per annum. (ii) That a product containing over 70 per cent of potassium chloride can be obtained by natural evaporation. (iii) That practically unlimited quantities of common salt and magnesium chloride could be produced. (iv) That an adequate area of land is available for the evaporating tanks required for the production mentioned. (v) That the area, although at present unhealthy, could be rendered habitable by suitable precautions.

"(*b*) (i) That no reliable estimate can be formed at the present time with regard to the cost of construction of the evaporating pans, or in connection with the cost of the operation of the process on a large scale. (ii) That, apart from working costs and capital charges, the cost of transport would absorb a considerable proportion of the market value of the potassium chloride, and would, to a large extent, render the great quantities of common salt and magnesium chloride unsaleable. (iii) That, in view not only of the ordinary fluctuations of the potash market, but also of the entirely unknown conditions of future production of potash in Europe and the demand for it in the markets of the world, the Committee is not in a position to forecast the commercial prospects of potash recovery from the Dead Sea. (iv) That, as long as the market for bromine remains relatively small and variable, it can probably be supplied adequately from other sources.

"(*c*) (i) That a large scale trial with evaporating pans covering several acres, together with excavations at different places in the available area, would form a necessary preliminary to an enterprise which, in any case, must be speculative."

New Incorporations

American Zohar, chemicals, P. Seligman, 122 East 42nd St., New York, $25,000 pf, 400 shs com.

Syracuse Benzol Co., Syracuse, oils—Higbee & Malpass, Syracuse, $75,000 pf, 20 shs com.

Quicksilver Corp. of America, New York City, mercury, quicksilver—U. S. Corp., 1,000 shs com.

Shadow Foam Inc., Wilmington, medicinal, chemical preparations—Corporation Trust Co. of America, 20,000 shs com.

Combustion Power Corp., Wilmington, devices for burning powdered coal and other compounds—Corporation Trust Co. of America, 1,000,000 shs com.

Nite Glochemical Co., Camden, N. J., manufacture chemicals—Corporation Trust Co., Philadelphia, 10,000 shs.

Wennis-Eoff Chemical Works, McAllister, 41 Broad St., Manhattan—1,000 shs com.

Solid Carbon Dioxide Corp., New York, solid carbon dioxide—Corporation Trust Company of America. $100,000—1,000 shs com.

The Vanco Co., Inc., New York, soaps, chemicals—Register and Transfer Co. 70,000 shs com.

Tungsten Electric Corp., Corona, N. J., tungsten, copper-Corp. Trust Co. of America—200,000 shs com.

Aidsol Products, Inc., Wilmington, drugs, medicines, chemicals—Corp. Trust Co. of America—100,000 shs com.

Champion Polish Specialties Co., chemicals—Hofstadter, Leslie & Booth, 51 Chambers St., Manhattan—100 shs com.

Consolidated Chemical Co., Wilmington, Del., realty—Corp. Trust Co. of America—2,000 shs com.

Cellulite Manufacturing Corp., Newburgh, celluloid—W. J. McCauley, 323 Bedford Park Blvd., Manhattan—25,000 shs.

Smith & Beck, Inc., Atlantic City, chemists—J. W. Parsons, Jr., Atlantic City—100,000.

Sun Ray Neon Corp. of California, Ltd., Wilmington, neon, other ray gases American Guarantee and Trust Co.—$250,000 pf, 7,500 shs com.

Canadian Nitroglycerine Co. Ltd., Calgary, Alberta—$100,000.

Gruble Products Co., chemicals—J. Rabkin, 1 Union Square—10,000.

Interstate Drum Corp., containers—D. Drescher, 51 Chambers St.—10,000.

Evergreen Chemical Co.—B. Bag, 150 Nassau St.—100 shs com.

Kleanwell Chemical Co., Platzman & Platzman, 11 W 42nd St., Manhattan—$10,000.

Beaumont Chemical Company, Ltd., Montreal Que. $50,000 John E. Grivell, Howard Hawthorne, Helena Peers.

Milton Sales Canada, Ltd., Toronto, Ont. $200,000, chemicals, Britton B. Osler, Robert B. F. Barr, Charles D. McGee.

Canadian Nitro Glycerine Company, Ltd., Calgary, Alta., $100,000, explosives, Percy L. Sanford, Alexander Hannah, John J. Saucier.

Water Treatments, Ltd., Calgary, Alta., $25,000, 25,000 shares of no par value chemicals, Alfred H. Williams, Ralph C. Burns, John S. Mavor.

Chemical Facts and Figures

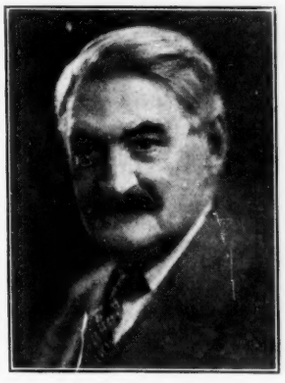
Monsanto Acquires Merrimac Through Exchange of Stock

Issues 1 and 1-5 Shares of Common for Each Share of Merrimac's Common—Gives Monsanto Plants and Distributing Centers on Eastern Seaboard—Company Also Acquires Fine Chemical Business of Mathieson Alkali Works.

Monsanto Chemical Works acquires Merrimac Chemical Co. and the Commonwealth division, Mathieson Alkali Works, Inc. The Merrimac Chemical Works, established in 1853 is the oldest chemical manufacturing concern in New England territory. Under the terms of the agreement Monsanto will issue 1 1-5 shares of common stock for each share of common stock of Merrimac.

Merrimac Chemical Works, through its plants at Everett and South Wilmington near Boston, is engaged principally in the manufacture and distribution of heavy chemicals, such as sulfuric acid, muriatic acid, alum, lacquers and solvents. Monsanto is the largest manufacturer in the United States of fine and medicinal chemicals and an important producer of heavy chemicals. Its production in the latter field will be substantially supplemented through the acquisition of the Merrimac company, which will retain its identity and will be operated as a subsidiary of Monsanto.

S. W. Wilder, Chairman
Merrimac Chemical Co.



John F. Queeny, Chairman
Monsanto Chemical Co.

If the proposal is approved by Merrimac's stockholders, Monsanto expects to expand and round out the manufacturing facilities in the Boston area The significance of the acquisition, from the standpoint of Monsanto lies chiefly in the fact that it will give the company strategically located plants and distributing facilities on the Atlantic seaboard. Merrimac's assets total approximately $9,000,000 and Monsanto's assets, after the acquisition, $24,000,000. Monsanto issued 6,490 shares for the acquisition of the fine chemical division of the Mathieson Alkali Works, Inc., and for services rendered in connection therewith.

The balance sheet of Monsanto, in addition to giving effect to the shares shortly to be issued for the Mathieson acquisition, also gave effect to: Purchase as of June 30, 1929 of Rubber Service Laboratories Co.; reduction as of July 15, of the stated value of the capital stock from $33 1-3 per share to $16 2-3 per share effected by issue of two shares for each one outstanding; issuance of 8,930 shares as a 1½% stock dividend on Aug. 1 and Oct. 1, 1929, respectively.

The present state of the balance follows:

Assets: Land, buildings and building equipment, machinery and equipment, $7,549,281; patents and processes, $1; cash and call loans, $629,250; U. S. Government securities, $99,718; notes and acceptances receivable, $20,601; accounts receivable, $522,943; inventories, $1,437,915; prepaid insurance, taxes, etc., $49,906; investments and advances, $2,325,029; deferred charges, $139,630; total, $12,774,274.

Liabilities: Capital stock (represented by 310,852 no-par shares), $5,180,866; accounts payable, $367,827; accrued interest, taxes, etc., $33,029; federal tax reserve, $153,032; dividends payable, $86,429; purchase money obligations, $419,051; funded debt, $1,753,500; depreciation and replacement reserve, $1,922,075; insurance and contingent reserve $65,650; other reserves, $91,309; earned surplus, $2,017,179; capital surplus, $684,327; total, $12,774,274.

Capital stock of the company is now listed on the N. Y. Stock Exchange. Outstanding common amounts about 398,000 shares.

Senate Changes Chemical Duties in Course of Tariff Debate

Senate completes consideration of all amendments to the chemicals, oils and paints schedule of the tariff revision bill which had been proposed by the Finance Committee, with the exception of those relating to coal tar products and two or three others set aside for future consideration. The rates approved during about a week of debate included the following: Gallic acid, 6 cents per pound; pyrogallic acid, 10 cents per pound; citric acid 17 cents per pound; nitric acid, free; tannic acid, less than 50 per cent, 4 cents per pound; more than 50 per cent, 10 cents per pound; red oil, 1½ cents per pound.

Casein 5½ cents per pound; calcium carbide, 1 cent per pound; carbon tetrachloride, 1 cent per pound; chloroform, 4 cents per pound; trichloroethylene, 25 per cent ad valorem; amyl and butyl acetate, 7 cents per pound; hexamethylenetetramine, 11 cents per pound; epsom salt, ½ cent per pound; potassium citrate, 13 cents per pound; potassium chlorate and perchlorate, 1½ cents per pound; refined potassium nitrate, 1 cent per pound; sodium citrate, 12 cents per pound.

Sodium phosphate, less than 45 per cent water, 1½ cents per pound; other sodium phosphate, ¾ cents per pound; sodium siliocofluoride, 1½ cents per pound; sodium sulfide, containing over 35 per cent sodium sulfide, 1 cent per pound; less than 35 per cent, ½ cent per pound; sodium sulfite, ½ cent per pound; linseed oil, 3.7 cents per pound; olive oil in containers of less than 40 pounds, 9½ cents per pound; and soy bean oil, 2.8 cents per pound.

Salesmen's Association of the American Chemical Industry holds formal installation of new officers at the Western Universities Club, New York, November 7. Although all were formally attired for the occasion, the entertainment following the dinner, installation and more serious business of the evening, proved to be informal, very.

Those who took office at that time were president, Victor E. Williams, Monsanto Chemical Works; vice-presidents, Fred A. Koch, Dow Chemical Co.; Ira Vandewater, R. W. Greeff & Co.; and H. F. Wilmot, A. Klipstein & Co.; secretary-treasurer, B. J. Gogarty, American Solvents & Chemical Co. Those who spoke included Ralph E. Dorland, retiring president, and Victor E. Williams, new president.

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Personal and Personnel

M. E. Clark, president, Welch, Holme & Clark Co., New York, retires from active participation in business, and is succeeded in office by E. D. Stults, formerly vice-president and treasurer. M. E. Clark, is the son of one of the organizers of the Welch, Holme & Clark Co. He had been connected with the house for more than forty years and had been its president since the death of H. W. Sherrill, November 5, 1928. E. D. Stults joined the company in 1898 and has been in charge of its sales for several years. He is succeeded as vice-president and treasurer by J. H. Vermilyea, who has been with the company for more than twenty-six years.

C. Olin North, chemist and rubber technologist, resigns from the Rubber Service Laboratories Co. and the Elko Chemical Co., Akron, Ohio, and Nitro, W. Va. He was one of the original incorporators of the Rubber Service Laboratories and served as secretary, treasurer and development manager for nearly eight years. When the company was absorbed by Monsanto Chemical Works, he became vice-president in charge of rubber service development.

Bradley Stoughton, head of department of metallurgy, Lehigh University, is awarded Grasselli Medal for 1929 at a joint meeting of the Society of Chemical Industry, American Chemical Society, Societe de Chimie Industrielle and American Electrochemical Society, held at the Chemists' Club, New York, November 8. B. D. Saklatwalla made the presentation and the acceptance speech was on "Materials for Aircraft Construction".

Dr. Irving Langmuir, president, American Chemical Society, and associate director of research, General Electric Co., addresses the Chemists' Club, New York and North Jersey sections, at a luncheon, October 19, on "Chemical Reactions Produced by Heating Tungsten or Platinum Filaments in Gases".

Harold W. Haines, manager chemical division, U. S. Industrial Alcohol Co., and Ray H. Giebel, manager, drier department, Harshaw Chemical Co., are among the new members of the Chemists' Club, New York.

Arthur S. Somers, president, Fred L. Lavanburg Co., dry colors, New York, is named president, National Exchange Bank & Trust Co., Brooklyn.

Edward P. Bartlett leaves fixed nitrogen laboratory, Department of Agriculture, Washington, to become associated with Du Pont Ammonia Corp.

W. S. Landis, vice-president, American Cyanamid Co., is elected a member of the honorary electrochemical fraternity, Epsilon Chi.

Baird Hall, formerly advertising manager, Utility Co., Inc., and previously on the staff of Calkins & Holden, is now a member of the copy department, Hazard Advertising Corp., New York.

Emil Mallinckrodt, half-brother of Edward Mallinckrodt, founder, Mallinckrodt Chemical Works, and until his retirement in 1925, chemist in that company's laboratories, dies September 29, aged 69.

Harry L. Derby, president, Kalbfleisch Corp., is elected vice-president and director, National Association of Manufacturers.

William R. Alexander, formerly New England manager, Barret Co., is now general sales manager, roofing department.

Henrik J. Krebs

Henrik J. Krebs, engineer, manufacturer, and chairman of the board of directors, Krebs Pigment & Chemical Co., Newport, Del., dies at Wilmington, October 7, aged 82. He was born in Denmark, June 27, 1847, and came to this country in 1879, becoming associated with Alfred D. Wagner in the Delaware Beet Sugar Co. Later he was employed with the Pusey & Jones Co. as an engineer, and built the first ice plant in Wilmington. In 1886, with Alfred D. Warner and William G. Pennypacker, he formed the Delaware Chemical Co. to manufacture anhydrous ammonia, and this firm through mergers, later became the National Ammonia Co., a subsidiary of E. I. du Pont de Nemours & Co. The Krebs Pigment & Chemical Co., which he organized in 1901 and of which he was chairman of the board at the time of his death, was acquired as a subsidiary by E. I. du Pont de Nemours & Co. early this year. In recognition of his services to the Royal Polytechnic College in Copenhagen, he was made a Knight of Denneborg by the king of Denmark and an honorary doctor's degree was conferred on him by the college.

Edward E. Slosson

Dr. Edward E. Slosson, widely known scientist, director, Science Service, and author of "Creative Chemistry" dies in Washington, October 15, aged 64. He was born in Albany, Kan., June 7, 1865 and received the degree of Bachelor of Science from the University of Kansas in 1890, and a master's degree two years later. Ten years later he received his Doctor of Philosophy degree from the University of Chicago. For twelve years he occupied the chair of chemistry at the University of Wyoming, from 1891 to 1903, and during the same period was also chemist for the Wyoming Agricultural Experiment Station. For seventeen years following, he was literary editor of "The Independent".

Dr. Slosson was well-known as an author and was for eight years a member of the faculty of the Columbia School of Journalism. He was a fellow of the American Association for the Advancement of Science, and a member of Phi Beta Kappa, Sigma Xi, the Washington Academy of Sciences, the Authors' Club of New York and the Cosmos Club of Washington.

William Wheelright Skiddy, former president, Stamford Manufacturing Co., manufacturer of natural dyes until the destruction of its plant by fire in 1919, dies at his home in Stamford, Conn., October 7, aged 84. He was born in New York, April 26, 1845 and was graduated from Sheffield Scientific School in 1865. Following a period in Wall street and in the Pennsylvania mining business, he became interested in the Stamford Manufacturing Co., which was founded in 1798, and was chosen its president in 1875. He was also a director and officer of several Stamford banks.

Dr. Otto Matthies, director in charge of the technical department, Agfa Co., Berlin, dies October 24, as the result of a fall from the sixteenth story of a New York hotel. He had arrived in this country October 22, and was stopping at the hotel in company with Dr. Walter Langer and Dr. Ernst Friedlander, both of the Agfa-Ansco Corp., Binghampton, N. Y., I. G. subsidiary. His companions had joined him with the intention of visiting the New York offices of the company and inspecting the plants of the American I. G. Corp.

William H. Barnard, treasurer, International Salt Co., dies in New York, October 5, aged 68. He was also president, Aiken Investment Co., New England Realty Co., and William H. Barnard, Inc. He was treasurer, Detroit Rock Salt Co., Genesee & Wyoming R. R. Co., Industrial Rubber Co., and Restof Mining Co.

Henry C. Murphy, head of De Lisser & Co., New York, dies in Greenwich, Conn., October 15, aged 65.

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Now, ACIDPROOF CEMENTS "HOECHST" are available for use in this country. Chemical manufacturers will find them ideal for acid proof linings of chemical apparatus, filters, vessels, pipes, kettles, etc.—for floor tilings, plastering, sewers, vent stacks, chimneys—for these cements are absolutely resistant to all kinds of acids with the exception of Hydrofluoric Acid.

ACIDPROOF CEMENTS "HOECHST" may be obtained in three qualities:

Acidproof Cement "Hoechst" No. 20 is of uniform volume, does not develop internal stresses during setting and drying, is pliable and does not become as hard as the other two grades.

Acidproof Cement "Hoechst" No. 25 is also of uniform volume and does not develop internal stresses during setting or drying; is, however, less pliable than No. 20, but more resistant to water.

Acidproof Cement "Hoechst" No. 30 becomes harder than No. 20 and No. 25, expands readily and thereby causes internal stresses. The latter property can be changed for individual needs by special mixtures.

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News of the Companies

E. I. du Pont de Nemours & Co., Inc., announces appointment of Dr. Elmer K. Bolton as assistant director of the company's central chemical organization. He has been with the company since 1915 and since 1921 has been chemical director, dyestuffs department. Dr. Harold W. Elley, formerly associate director, Jackson Laboratory, has been appointed to succeed Dr. Bolton, while he, in turn, is succeeded by William S. Calcott, formerly head of the general division.

American Agricultural Chemical Co. elects Ralph A. Powers, executive vice-president, and Louis H. Carter, vice-president in charge of manufacturing. The former was formerly president, Robertson Paper Box Co., Montville, Conn., while the latter has been connected with the American Agricultural Chemical Co. since 1915, having been general superintendent in charge of manufacturing since 1925.

Michigan Alkali Co. announces that its future shipments of soda ash may be had in Taggart-Bates multi-wallpaper bags, each bag carrying 100 pounds. The Company states that new containers are virtually five separate bags in one and effect economy of time and labor and reduce losses. Bags are guaranteed against leakage, breakage and moisture.

Industrial Chemical Sales Co., Inc., New York, announces that it has completed arrangements with Floatstone Products Co., Los Angeles, for the exclusive marketing and distribution of the latter company's diatomaceous earth for filtration and other purposes. The filtration grade will be offered under the trade name of "Diafilt".

Rolls Chemical Co., Buffalo, announces the addition of Donald D. Bradley and Walter J. Kilmer to the sales department. C. H. Throm is now sales manager. The company has leased additional office space adjacent to its present quarters and plans to open additional warehouses.

Carbide & Carbon Chemicals Corp., New York, announces election of G. O. Curme, H. E. Thompson and R. W. White as vice-presidents. Company has leased space in Baltimore for branch sales office.

Davison Chemical Co. acquires two more corporations which are manufacturers of fertilizer mixtures. They are Washington, Alexander & Cook, Charlestown, W. Va., and Oxford Packing Co., Oxford, Pa.

Roessler & Hasslacher Chemical Co. takes over all contracts of the Dovan Chemical Corp., New York, for phenylguanidine. The latter company withdrew as suppliers of this material as of October 15.

Alcohol division, Pennsylvania Sugar Co., represented by A. K. Hamilton, New York, publishes a 48-page booklet entited, "Alcohol for Industrial Purposes". Copies will be furnished upon request.

Clarence Morgan & Co., Chicago, publishes new 30-page catalog entitled, "Industrial Chemicals".

Charles Pfizer & Co. announces production of ethyl vanillin, marketed under the trade name of "Vanethal".

National Aniline & Chemical Co. announces a new black color, "National Diazine Black S Extra".

Vanadium Corp. issues new catalog listing "Vancoram" chemicals with prices and descriptions.

American Cyanamid Co., Acquires American Powder Co., Solvent Maker

American Cyanamid Co. acquires the assets and business of the American Powder Co. with plants in Maynard, Mass., one of the oldest manufacturers of explosives in the country. The company is now largely employed in the manufacture of nitrocellulose used in the lacquer industry, artificial leather and coated fabrics. The manufacture of powder and explosives has ceased to be the primary activity of the business. American Cyanamid Co. manufactures some of the raw materials which are used by the American Powder Co.

American Powder Co. recently secured secret formulas and processes for the economic production of nitrocellulose and solutions. The company's properties consist of about 1,000 acres of land, administration and laboratory buildings, employee dwellings, black and smokeless powder mills and magazines, a cotton nitrating plant, several miles of tramway, a hydro-electric plant, two steam plants, and transmission lines. The property has been appraised at $1,646,000. The black powder mills have a capacity of 120,000 kegs annually; the smokeless powder plant, 600,000 pounds; the cotton purifying plant, 3,000,000 pounds; the cotton nitrating plant, 3,000,000 pounds, and the lacquer plant, 700,000 gallons of solutions and finished pigmented lacquers.

Officers of the company are: President, M. J. Connoly, Washington, D. C.; vice-president and treasurer, T. M. R. Meikleham, Edgartown, Mass.; and vice-president, E. W. Hawley, Boston.

Air Reduction and U. S. I. Acquire Control of Pure Carbonic Co.

Air Reduction Co. and U. S. Industrial Alcohol Co. acquires a controlling interest in Pure Carbonic Co. of America. This latter company had previously acquired the Compressed Carbonic Co., Inc., Pure Carbonic Co. of Illinois and Pure Carbonic Co. of California.

Pure Carbonic Co. of America now owns and operates plants producing carbon dioxide or controls satisfactory sources of supply at Philadelphia, Baltimore, Chicago, St. Louis, San Francisco and Los Angeles. Certain stockholders of the old Pure Carbonic Co. of Illinois retain their interest as stockholders in the new Pure Carbonic Co. of America, but Air Reduction and U. S. Alcohol will approximate 75 per cent of the stock of that company.

Kuttroff, Pickhardt & Co., Inc., announces new acid-proof cement, sold under the trade-name of "Hoechst", which is obtainable in three grades. No. 20 is said to be of uniform volume, does not develop internal stresses during setting, is pliable and does not become as hard as the other two grades. No. 25 is said to be also of uniform volume and does not develop internal stresses, but is less pliable than No. 20, but more resistant to water. No. 30 is said to become harder than the other two, expands readily and thereby causes internal stresses. The latter property can be changed for individual needs by special mixtures.

United Film Industries, Inc., New York, announces through its president, Hans von Fraunhofer, that negotiations are under way with the Du Pont Rayon Co. for the adoption of a new rayon process in this country. The process was invented by Dr. Jan Szemzo, a Hungarian chemist, formerly assistant professor of technology, University of Munich, and is said to simplify the production of cellulose, employing reagents which do not injure the raw materials.

Hercules Powder Co. issues booklet descriptive of the company's activities, entitled, "The Labors of a Modern Hercules". Copies may be obtained on request.

Arnold, Hoffman & Co. announces new alizarine color, "Alizarine Irisole R Extra".

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Federal Trade Commission Sponsors Solvents Trade Practice Meeting

Solvents trade practice conference will be held under supervision of Federal Trade Commission, at some date yet to be announced. Manufacturers who applied to the Commission for this conference represent more than 75 per cent of the production and sale of the ester and technically competitive types of solvents. They believe that their industry, which is almost a new one, should eliminate a number of unsound business practices, among which are the following:

"Variations from open and publicly announced prices and terms; acceptance of orders at old prices following the announcement of price changes; concessions in price for like quantities purchased by buyers occupying the same position in the channels of distribution; payment for storage in customers' warehouses on solvents purchased by such customers; special services to customers without appropriate charges therefor, and misbranding."

The solvents conference has been assigned to Commissioner Charles H. March for supervision.

Lacquer Institute Formed

Lacquer Institute is formed by seventeen lacquer manufacturers whose combined output is claimed to be approximately 75 per cent of domestic production. Officers are chairman, Charles H. Reed, Forbes Varnish Co., Cleveland; vice-chairman, A. W. Steudel, Sherwin-Williams Co., Cleveland; secretary-treasurer, H. B. Sweatt, New York; members of executive committee, W. C. Dabney, Dabney-Jones Co., Louisville, and P. E. Kennedy, Murphy Varnish Co., Newark.

E. I. du Pont de Nemours & Co., Inc., J. T. Baker Chemical Co., Carbide & Carbon Chemicals Corp., and U. S. Industrial Alcohol Co. are among those firms who contributed to the funds for the establishment of the Francis P. Garvan chair of chemical education at Johns Hopkins University.

Eastman Kodak Co. is producing transparent cellulose sheeting to meet experimental needs in manufacture of transparent food containers lighter in weight than glass. This material is being supplied to an associated company of American Can Company, which is carrying on the experiments.

Standard Oil Co. of New Jersey secures complete patent rights to the process for the hydrogenation of coal, oil and allied materials, for all points outside of Germany, under the terms of an agreement concluded with the I. G. Farbenindustrie.

Sylvania Industrial Corp., announces through its president, Dr. F. H. Reichel, that it will soon begin the manufacture of a transparent wrapping paper from processed wood pulp. The Company is now constructing a $1,000,000 chemical plant at Fredericksburg, Va.

S. F. Baker & Co., Keokuk, Ia., chemicals and drugs, is reorganized with Clyde R. Joy, president; Myrle F. Baker, vice-president; and John A. Dunlap, secretary-treasurer. Capital stock now consists of 6,000 shares of preferred and 4,000 shares of common, $100 par.

Charles Pfizer, son of the founder of Charles Pfizer & Co., New York, dies in Bernardsville, N. J., October 6, aged 68. His brother Emile Pfizer is president of the company.

Archer-Daniels-Midland Co. acquires large interest in the Werner G. Smith Co., chinawood oil, Cleveland.

Drug & Chemical Section, New York Board of Trade, adopts research program for the study of costs.

Palestine Potash, Ltd., Formed to Exploit Dead Sea Chemicals

Palestine Potash, Ltd., is formed in London with $2,000,000 capital to exploit the chemical resources of the Dead Sea. Actual work will be begun immediately at the confluence of the River Jordan and the Dead Sea, where elaborate drying plants have been erected and 400 workers engaged.

The Earl of Lytton, former Viceroy of India, will be chairman of the new company, which intends to increase its capitalization as business warrants. Shares already have been subscribed by the British and American directors, but additional capital will be offered to the public in accordance with the terms of the concession.

Among the American directors are Felix Warburg and Bernard Flexner of New York.

Although the start necessarily will be slow, the company is bound by its concession to produce at least 50,000 tons of potassium chloride annually after the tenth year. The work will be carried out by means of huge drying tanks built on the hills on each side of the Jordan's mouth.

The water of the Dead Sea, which is 300 feet below sea level, is said to be among the world's richest repositories of valuable salts, and potash is expected to become one of Palestine's most important products. The potash will be taken by motor truck to Jerusalem and thence to Haifa by rail for export.

Government's Helium 98 Per Cent Pure

Amarillo, Tex., helium plant, built and operated by the Bureau of Mines, establishes a record in cost of production and purity, with an output of 847,840 cubic feet of the gas in September at a cost of $14.01 per 1,000 feet of contained helium, the Department of Commerce announced Oct. 25.

The amount of the helium element in the 847,840 cubic feet output was 828,700 cubic feet, showing that the product has an average purity of 97.7 per cent, it was stated.

Industrial Alcohol Institute, Inc., announces appointment of Edward C. Stark, Detroit, as special representative for contacts with automobile and truck manufacturers. He will concentrate his efforts on the sale of completely denatured alcohol for antifreeze purposes.

Colloid Chemical Research, Inc., is established in Zurich, Switzerland, with American participation, for the purpose of conducting chemical research in the colloid chemical field, to acquire patents and processes for commercial development, and to erect laboratories in Switzerland and abroad.

Association of Official Agricultural Chemists holds forty-fifth annual convention, October 28, 29 and 30, and elects following officers: honorary president, Harvey W. Wiley; president, E. M. Bailey, New Haven; vice-president, H. D. Haskins, Amherst; secretary-treasurer, W. W. Skinner, Washington.

Industrial Naphtha & Solvent Co. is established in Wichita Falls, Tex., to market naphtha and other solvents in tankcars. W. C. Duncan, who with J. G. Rudy and C. W. Scharatt incorporated the company, is in charge of sales.

American Association of Textile Chemists & Colorists will hold its annual meeting at the Bellevue Stratford Hotel, Philadelphia, December 6 and 7.

Oliver Cordrey, until two months ago vice-president, William B. Tilghman Co., fertilizers, Salisbury, Md., dies October 26 as the result of an automobile accident.

Chauncey W. Dill, vice-president, Columbia Naval Stores Co., Savannah, dies at his home in Brooklyn, October 31, aged 66. He organized the company in 1913.

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United States Exports of Chemicals to Europe Show Gain Over 1928 Period

Europe Takes 10 Per Cent More in 6-Month Period Than in Corresponding Period of 1928—South American Trade Increases 15 Per Cent—Canada Continues to be Largest Buyer Taking $16,800,000 Worth.

United States exports of chemicals and allied products to foreign countries during the first half of 1929 recorded some rather interesting changes in distribution as compared with the first half of 1928. Europe, which still offered the best outlet for chemicals as a whole—35 per cent of the total—recorded a gain of 10 per cent over the corresponding requirements of 1928, with the increases extending over many commodities, especially coal-tar products, carbon black, and paints.

Another important change, according to the Department of Commerce lies in the 15 per cent improvement of trade to South America, which is particularly significent inasmuch as the improvements were made in paints and in industrial chemicals. The Far East advanced nearly one-fifth, incident to larger purchases of prepared fertilizers and superphosphates by Japan, and, to a less degree, by the Netherland East Indies and British India, as well as to much greater activity in the dye trade. In this instance China nearly doubled its purchases.

Europe as a whole bought more of nearly all chemicals, but the interesting changes were in the coal-tar products, industrial chemical and the pigment, paint, and varnish groups, as an additional million dollars' worth of each group was destined for this section.

In the coal-tar classification the advance was due primarily to a greater demand for benzol. In industrial chemicals the expansion represented comparatively small gains in many commodities. In the pigment, paint, and varnish group the larger gains were made in carbon black, zinc, oxide, and lacquers.

Russia, in buying $735,000 worth of naval stores, forged to the front as making the largest gain of any individual country. Russia also participated in the coal tar, medicinal and fertilizer purchases, after no share in the preceding year.

Sales of chemicals and allied products to Germany were practically one-quarter greater than in the first half of 1928—a total of $9,800,000—making this country the third best market for American chemicals. As would be expected the largest increase was made in shipments of benzol. Germany also bought somewhat larger amounts of naval stores, carbon black, lacquers, industrial chemical specialties, and the land-pebble grade of phosphate rock.

Although there was little fluctuation in the total trade with France, there was rather a large drop in shipments of crude coal-tar products and industrial chemicals, partly offset by considerable increases in sulfur and carbon black. Orange oil to the amount of $40,000, peppermint oil to the amount of $13,000, and other essential oils, $33,000, were shipped to France during the first half of 1929.

The United Kingdom, the largest individual market for American chemicals until 1928, when it was displaced by Canada, purchased nine per cent more chemicals and allied products during the first half of 1929, or $12,900,000 worth. Like the other European countries the largest gains were in rosin; turpentine, which very nearly doubled; carbon black; zinc oxide; white lead; and, in fact, in the majority of commodities of the pigment, paint and varnish class.

Practically one-eighth more chemicals were shipped to North and Central America during the current half year as in the first half of 1928. Canada, which for the past year and a half has been the outstanding individual market for American chemicals, in taking $16,800,000 worth surpassed the previous half year's figure by nearly one-fifth.

During the first half of 1929 exports to South America, representing one-eighth of the total, also have been on the ascendancy. In this region, the increase in sales of pigments, paints, and varnishes from $600,000 to nearly $1,000,000 is of interest, especially as the majority of countries shared in this betterment in trade.

Argentina, the fifth best outlet for American chemicals, purchased more of practically all chemicals and allied products, with perhaps the most important increases in paints and lacquers.

Japan was the fourth largest market, taking 7 per cent of the total, or $7,400,000—$800,000 more than in the first half of 1928. A notable advance was made in fertilizers and somewhat smaller gains were noted for dyes and rosin. An equally noticeable loss was recorded in total shipments of industrial chemicals, largely because no sales of acetate of lime occurred during the first half of 1929.

I. G. Shares Decline in Berlin Market Starting Inquiry into Condition

I. G. Farbenindustrie's shares have for some time been declining on the Berlin bourse, which is serious because its shares have previously been considered gilt-edge stock by the small investor. The board of the combine issued a brief official statement holding itself quite at a loss to explain the decline and affirming that the business all round was as prosperous as ever. But this statement did not stimulate the share market nor did it allay public uneasiness which culminated in a request on the part of the "Neue Pfalzische Landeszeitung" for a more detailed explanation by the I. G. of the many recent dismissals from the Ludwigshaven works. The board of the I. G. did grant an interview to the representative of this paper, in which a number of admissions were made, according to the "Chemical Trade Journal". The first was that the I. G. was considerably overproduced in certain products, particularly in fertilizers, the warehouses at Oppau being so stocked that a temporary stoppage of production was essential. The poor demand on the part of home agriculture and the international competitive position were blamed for this state of affairs. The willingness of the I. G. to enter the international nitrogen agreement seems readily enough explained in the light of these revelations. Rumour has been busy in Germany to the effect that the production of synthetic benzine has been stopped by the I. G. owing to the impossibility of competing with the present low prices of the imported petroleum spirit. The board more or less admitted this and added that within the next few months anything up to two hundred of the staff would have to be dismissed. It was emphasized that these dismissals were not due to the fusion nor to the rationalization measures in the industry but just to bad trade in certain branches and that despite the dismissals there were still 2,500 more men employed in Leverkusen than there were in 1925.

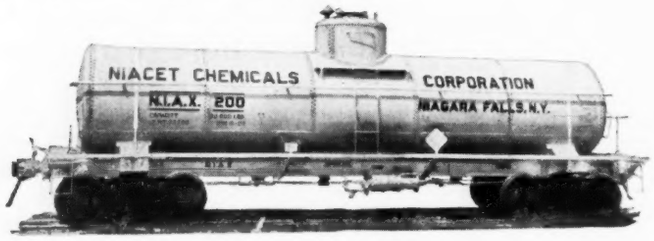
Vigorous efforts are being made to prevent the feared outbreak of a nitrogen price war in Germany. The nitrogen fixation plants outside the I. G. Farbenindustrie A. G. are increasing their rate of output very rapidly. This is particularly true of the Ruhr-Chemie A. G., which was formed some years ago by the reorganization of the Kohle-Chemie A. G. and which is really a co-operative nitrogen fixation project of a number of collieries and cokeries in the Ruhr. The Ruhr-Chemie A. G. which has been financed to a considerable extent by American capital, employs at its Sterkrade-Holten plant a combination of the Concordia-Linde and Casale processes for the production of synthetic ammonia, and its present rate of output is believed to be in the neighborhood of 250 to 300 tons of fertilizer (average actual nitrogen content 20 per cent) per day. So far the cleavage in unity of the German nitrogen industry has not led to any appreciable price-cutting, but with the increase of the output of the "outsiders" both parties view the future with some misgiving. It is now stated that the I. G. Farbenindustrie A. G. have opened negotiations with the Ruhr-Chemie A. G. for the purpose of consolidating the whole industry.

International Acetylene Association will hold annual meeting at Congress Hotel, Chicago, November 13, 14 and 15.

ACETIC ACID

ALUMINUM Tank Cars of 65,000 pounds capacity specially designed and equipped with steam coils have been built for the purpose of shipping our WATER WHITE GLACIAL ACETIC ACID.

Shipments by these cars will assure our customers of obtaining a purity of product never before realized.



NIACET PRODUCTS

Acetaldehyde
Acetaldol
Acetic Acid
Crotonaldehyde
Paraldehyde
Paraldoi
Niatan

NIACET CHEMICALS CORPORATION

SALES OFFICE AND PLANT

Niagara Falls
NEW YORK

KESSCO PRODUCTS

SOLVENTS AND PLASTICIZERS

for the Lacquer Industry

Ethyl Acetate
Butyl Acetate, Nor. and Sec
Amyl Acetate

Butyl Propionate
Amyl Propionate
Butyl Butyrate
Ethyl Lactate
Butyl Alcohol Sec.
Amyl Alcohol

Refined Fusel Oil
Butyl Stearate
Dimethyl Phthalate
Diethyl Phthalate

Dibutyl Phthalate
Diamyl Phthalate
Dibutyl Tartrate
Triacetine

Special Solvents and Plasticizers

Warehouse stocks carried at all principal consuming points

KESSLER CHEMICAL CORPORATION
ORANGE, N. J.

The Financial Markets

Du Pont Nine Months' Net Higher Than Corresponding Period of 1928

Company Reports Net of $5.64 Per Share as Compared with $5.19 in Same Period of Previous Year—September Quarter $1.80 Per Share Against $1.95 Last Year and Against $1.44 in Previous Quarter.

Report of E. I. du Pont de Nemours & Co. for nine months ended September 30, 1929, shows consolidated net income of $61,566,243 after interest, federal taxes, etc., equivalent after debenture dividends, to $5.64 a share (par $20) on average of 10,153,014 shares of common stock. This compares with $52,278, 679 or $5.19 a share on the equivalent of 9,315,803 shares in first nine months of 1928.

Consolidated net income for quarter ended September 30, 1929, was $20,029,831 after above charges, equal to $1.80 a share on average of 10,322,481 common shares against $16,296,567 or $1.44 a share on 10,298,553 average common shares in preceding quarter and $19,581,897 or $1.95 a share on the equivalent of 9,315,803 shares in September quarter of previous year.

Company's outstanding shares have been increased from time to time during the year by the issue of new stock for the acquisition of minority interests in Du Pont Cellophane Co., Du Pont Rayon Co. and Du Pont Ammonia Corp., and the entire interest in Krebs Pigment and Chemical Co.

Income from operations for the third quarter was $9,569,517, compared with $6,059,047 for the third quarter of 1928. Operations yielded $26,354,416, and investments $38,575,603 in the first nine months of 1929, compared respectively with $15,920,630 from operations and $38,120,900 from investments in the same period of 1928, when a non-recurring item of $2,286,000, representing profit from the sale of 114,000 shares of United States Steel Corporation common stock, was included in the return from investments.

Net income after making provision for federal income taxes and interest on bonds of subsidiary companies and before payment of dividends on debenture stock was $20,029,831 for the third quarter, and $61,566,243 for the first nine months of 1929, compared respectively with $19,581,897 for the third quarter and $52,278,679 for the first nine months of 1928.

The surplus at September 30, 1929, was $147,416,880 compared with $128,042,620 at September 30, 1928, and $105,710,319 at the beginning of 1929.

Union Carbide & Carbon Corp. Reports Quarter Net of $9,522,421

Union Carbide & Carbon Corp. and subsidiaries report for quarter ended September 30, 1929, net profit of $9,522,421 after interest, federal taxes, depreciation and preferred dividends of subsidiaries, equivalent to $1.14 a share on 8,313,818 no-par shares of stock. This compares with $7,324,297, or 88 cents a share, on 8,306,108 shares in preceding quarter and $7,756,741, or $2.82 a share, on 2,742,072 shares in third quarter of 1928.

Net profit for first nine months of 1929, totaled $24,050,664 after above charges, equal to $2.89 a share on 8,313,818 shares, comparing with $19,629,483, or $7.16 a share, on 2,742,072 shares in first nine months of previous year.

Mathieson Alkali Net Amounts to 94 Cents Per Share for Quarter

Mathieson Alkali Works, Inc., reports for quarter ended September 30, 1929, net income of $609,532 after depreciation, depletion, federal taxes, etc., equivalent after 7% dividend requirements on 28,382 shares of preferred stock to 94 cents a share on 591,553 no-par shares of common stock. This compares with $610,697 or 96 cents a share on 588,328 shares of common in preceding quarter and $573,891 or $3.60 a share on 147,207 common shares in September quarter of 1928.

Net income for first nine months of 1929, totaled $1,726,904 after above charges, equal to $2.66 a share on 591,553 common shares, against $1,560,020 or $9.72 a share on 147,207 common shares in first nine months of previous year.

Commercial Solvents' Reports Quarter Net of $4.46 Per Share

Commercial Solvents Corp. reports for quarter ended September 30, 1929, net profit of $1,011,738 after depreciation, federal taxes, etc., equivalent to $4.46 a share on 226,517 no-par shares of stock. This compares with $953,569 or $4.21 a share on 226,517 shares in preceding quarter and $898,534 or $4.12 a share on 217,722 shares in September quarter of 1928.

Net profit for nine months ended September 30 totaled $2,809, 662 after above charges, equal to $12.40 a share on 226,517 shares, against $2,099,774 or $9.64 a share on 217,722 shares in first nine months of previous year.

Dow Chemical Co. declares a dividend of 50 cents on common and regular quarterly dividend of $1.75 on preferred, both payable November 15 to stock of record November 1. This is the first dividend since a 400% stock dividend was paid on the common on October 15. Before the stock dividend, common received $6 annually besides extras.

Newport Co. and subsidiaries report net earnings of $442,336 after all charges, reserves and taxes for the third quarter of 1929, equal after class A convertible stock dividends to 95 cents a share earned on 404,565 shares of common stock. For the first and second quarters net earnings were $355,930 and $375,687 respectively.

Vanadium Corp. declares an extra dividend of $1, payable December 16 to stock of record December 2, and regular quarterly dividend of 75 cents, payable November 15 to stock of record November 1. Similar extras were paid in December, 1927, and December, 1928.

Will & Baumer Candle Co., Inc., declares an extra of 10 cents and regular quarterly dividends of 10 cents on common, payable November 15 to stock of record November 1, and $2 on preferred payable January 2 to stock of record December 16.

American Solvents & Chemical Corp. declares initial quarterly dividend of 75 cents on preferred, payable November 15 to stock of record October 26.

International Agricultural Corp. declares regular quarterly dividend of $1.75 on the prior preferred stock, payable December 2 to stock of record November 15.

Shawinigan Chemicals, Ltd., of Canada increases capitalization from 1,000,000 shares of common stock to 2,000,000 shares of no par value.

Sulphuric Acid

60° and 66° Commercial

66° Textile Clear Electrolyte

Copper Sulphate

Granular, Large, Medium and Small Crystals

SOUTHERN AGRICULTURAL CHEMICAL CORP.

General Offices

ATLANTA — 621-625 Grant Building — GEORGIA

Oxalic Acid

Chlorate Soda

Phosphorous Compounds

MANUFACTURED BY

OLDBURY ELECTRO-CHEMICAL CO., NIAGARA FALLS, N. Y.

JOSEPH TURNER & CO.

19 Cedar St. -:- New York

Texas Gulf Sulphur Co.'s Net Higher for First Nine Months

Texas Gulf Sulphur Co., Inc., reports for quarter ended September 30, 1929, net income of $4,028,959 after depreciation and federal taxes, but before depletion, equivalent to $1.58 a share on 2,540,000 shares of no-par stock. This compares with $3,571,270, or $1.40 a share, in preceding quarter and $3,680,723, or $1.45 a share, in third quarter of 1928.

Net income for nine months ended September 30, totaled $11,480,489 after above charges, equal to $4.52 a share, comparing with $10,355,381 or $4.08 a share in first nine months of previous year.

During the last quarter the company increased its reserves for depreciation and accrued federal taxes by $567,194, making total of these reserves $12,389,009 on September 30, 1929.

Air Reduction's Net in September Quarter Largest in History

Air Reduction Co., Inc., reports, for quarter ended September 30, 1929, net profit of $1,562,622, after depreciation, federal taxes, etc., equivalent to $2.05 a share on 761,863 no-par shares of stock, comparing with $1,492,772, or $1.97 a share, on 755,864 shares in preceding quarter, and $799,798, or $1.17 a share, on 683,873 shares in third quarter of 1928. Earnings for September quarter of 1929 were the largest for any quarter in the history of the company.

For nine months ended September 30, net profit was $4,292,956, after federal taxes, equal to $5.65 a share on 761,863 shares. In first nine months of 1928, company reported profit of $2,528,166 before federal taxes.

National Distillers Profit Lower

National Distillers Products Corp. reports for quarter ended September 30, 1929, profit of $14,900 after interest and depreciation, but before federal taxes, comparing with $88,666 in preceding quarter. Company reported for September quarter of 1928, profit of $153,084 after interest, etc., but before depreciation, federal taxes and amortization of brands, trademarks, etc. September quarter profit does not include profit on sale of assets.

Profit for nine months ended September 30, 1929, totaled $462,845 after interest and depreciation, but before federal taxes. For first nine months of 1928 profit after interest, etc., but before depreciation, federal taxes and amortization of brands, trademarks, etc., amounted to $311,218.

Industrial Rayon Corp. reports for quarter ended September 30, 1929, net profit of $369,610 after depreciation, interest, federal taxes, etc., equivalent to $1.94 a share on 190,341 no-par shares of common stock. This compares with $313,770 or $1.65 in preceding quarter and $478,917 or $2.51 a share in third quarter of 1928.

Net profit for nine months ended September 30, totaled $1,063,208 after above charges, equal to $5.58 a share comparing with $1,159,250 or $6.08 a share in first nine months of previous year.

Sherwin Williams Co. declares a quarterly dividend of $1 on the common and an extra dividend of 12½ cents on the common, both payable November 15 to stock of record October 31. Quarterly dividend of $1 places stock on $4 annual basis against $3 previously. Heretofore, company had been paying extra dividends of 25 cents in addition to the quarterly disbursements. The regular quarterly dividend of $1.50 on the preferred was also declared, payable December 1 to stock of record November 15.

Atlas Powder Co. declares regular quarterly dividend of $1.50 on preferred, payable November 1 to stock of record October 18.

American Commercial Alcohol Reports Quarter Surplus of $328,768

American Commercial Alcohol Corp. for quarter ended September 30, 1929, reports surplus available for common stock of $328,768, after charges, federal taxes and preferred dividends, equivalent to $1.05 a share on 310,919 no-par shares of common stock. This compares with $228,968, or 76 cents a share on 300,229 common shares in preceding quarter, and $147,841, or 34 cents a share, in third quarter of 1928, based on common shares outstanding on September 30, last.

Surplus for common stock for first nine months of 1929 totaled $805,867, equal to $2.59 a share on 310,919 shares outstanding September 30, last. Comparison for the first nine months of 1928 is not available.

American Commercial Alcohol Corp. calls all of the $2,397,600 outstanding 7% cumulative preferred on February 1, 1930, at $105, plus the quarterly dividend then due of $1.75.

Archer-Daniels-Midland Offers New Stock at $30 Per Share

Archer-Daniels-Midland Co. is offering common stockholders rights to subscribe to additional common stock in ratio of one new share at $30 to every seven shares held of record October 21. Rights will expire November 12. Proceeds will be used to reimburse company for its recent purchase of an interest in Werner G. Smith Co. of Cleveland and to provide additional working capital. Archer-Daniels-Midland Co. declared the regular quarterly dividends of 50 cents on common and $1.75 on preferred, both payable November 1 to stock of record October 21. Company and subsidiaries report for year ended August 31, 1929, net profit of $1,453,408 after depreciation, federal taxes, etc., equivalent after 7% preferred dividends to $2.45 a share on 480,852 no-par shares of common stock outstanding at end of year. This compares with $2,018,510 or $8.03 a share on 213,712 common shares outstanding in preceding fiscal year.

Duval Sulphur Increasing Capital

Duval Texas Sulphur Co. approves a plan whereby holders of present 100,000 outstanding capital shares will receive five new shares in exchange for each share now held. Authorized capital capital is to be increased to 550,000 shares, of which 50,000 will be reserved for future expansion. Special meeting of stockholders has been called for October 31. Company is a subsidiary of United Gas Co. Its property is located 65 miles inland from Corpus Christi, Texas. Plans are being made for erecting a plant which will double the present output of sulphur.

Hercules Powder Co. reports for nine months ended September 30, 1929, net profit of $3,236,190 after depreciation, taxes, etc., equivalent after dividend requirements on 7% preferred stock, to $4.41 a share on 598,000 no-par shares of common stock. This compares with $2,820,112 or $15.10 a share on 147,000 shares of common stock in first nine months of 1928. Net profit for quarter ended Setpember 30, totaled $1,200,652 after above charges, equal to $1.67 a share on 598,000 common shares, against $1,096,492 or $1.50 a share on common in preceding quarter and $1,030,463 or $5.66 a share on 147,000 common shares in September quarter of previous year.

Borax Consolidated, Ltd., passes interim dividend on its £1,150,000 of £1 deferred ordinary shares for first time in 31 years. Company has issued capital of £2,550,000, and £2,214,234 of bonds and debentures.

The Industry's Stocks

1929 Oct. 31 High	1929 Oct. 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Oct.	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1929		1927
								NEW YORK STOCK EXCHANGE						
151¼	140¼	223⅜	95¼	99⅜	59	1,071,900	1,889,000	Air Reduction	No	762,000	$3.00	*6 mo.	3.61	4.61
253	246	354½	204½	252½	146	164,900	816,400	Allied Chem. & Dye	No	2,178,109	6.00	1928	11.12	10.03
121½	121½	125	120¼			5,200	34,500	7% pfd	100	392,849	7%	1928	68.63	62.59
8	7⅝	23⅝	4	26	15⅝	35,900	170,700	Am. Agricultural Chem	100	333,221	...			1.59
28½	28⅜	73⅜	25½	79½	55⅜	20,500	68,200	pfd	100	284,552	...		2.47	7.86
141½	133	184½	107¾	117⅞	70⅛	1,311,000	4,684,100	American Can	25	2,473,998	3.00	1928	6.86	4.11
137	137	142	136	147	136½	3,000	36,800	pfd	100	412,333	7%	1928	48.17	31.66
33½	31	55	20	87¼	74	127,300	364,500	Amer. Com. Alc	No	304,000	1.60	6 mo.	1.59	3.39
59½	49½	81½	41¼	63¾	39	150,900	2,018,900	American Metal, Ltd	No	868,000	*3.00	6 mo.	1.73	3.58
115	110	135	110	117½	109	2,000	31,300	pfd	100	69,000	6%	6 mo.	24.10	26.52
93½	87½	130¼	80	293	169	318,400	3,559,800	American Smelt. & Refin	No	1,830,000	4.00	1928	8.24	6.55
135	134	138	130	142	131	6,600	35,300	pfd	100	500,000	7%	1928	37.17	30.96
14⅞	11¼	49¼	8¼	57	6⅜	78,600	669,900	Amer. Zinc & Lead	25	200,000	...	3 mo.	0.97	..
70	50	111¼	50	117⅜	40	5,900	79,400	pfd	25	96,560	6.00	3 mo.	3.92	d5.99
104	97¼	140	75½	120½	53¾	2,858,500	29,540,200	Anaconda Copper Mining	50	8,509,000	7.00	1928	6.63	3.37
32⅜	30¼	49½	22¼	112⅞	55½	72,400	491,400	Archer Dan. Mid	No	481,000	2.00	9 mo.	0.49	8.04
...	...	...	...				2,120	pfd	100	41,000	7%	9 mo.	22.10	46.94
100	95½	140	80	114	63	68,500	268,200	Atlas Powder Co	No	261,438	4.00	6 mo.	3.54	4.30
99½	99	106½	98½	110½	102	890	5,660	pfd	100	90,000	6%	6 mo.	13.27	18.76
50⅜	43	77⅞	30	66½	50	766,900	6,385,400	Atlantic Refining	25	2,670,000	1.00	6 mo.	3.06	7.72
3⅛	3⅛	9½	2	12½	4½	35,500	366,100	Butte Copper & Zinc	5	600,000	...	6 mo.	0.16	0.31
6⅜	6½	12⅜	5	16⅜	8½	11,300	149,800	Butte Superior Mng	10	290,198	2.00	1928	0.28	0.94
33	31½	47⅛	20	122	65	205,800	508,700	By Product Coke	No	760,000	*1.00	6 mo.	6.27	6.59
1⅜	1⅜	4	1	5⅜	1⅜	17,400	246,900	Calla Lead & Zinc	10	724,592	...	6 mo.		
37⅞	36	61⅞	25	47⅜	20½	167,000	2,332,300	Calumet & Hecla	25	2,001,000	4.00	6 mo.	1.24	1.55
18	18	32	13	119	61½	36,800	309,100	Certainteed Prod	No	400,000	...	6 mo.		
90	50	81½	47½	63½	23½	800	9,600	7% pfd	100	62,904	7%	6 mo.	10.63	6.77
100	70	127½	55	74½	37⅜	1,100	1,333,700	Chile Copper	25	4,415,497	3.50	3 mo.	2.14	4.52
182½	170	344	119	134⅜	79	97,900	679,000	Columb Carbon	No	457,000	4.00	6 mo.	4.56	6.30
40⅛	35½	63	20½	250½	137⅜	518,000	962,700	Commercial Solvents	No	227,000	8.00	6 mo.	7.94	13.20
64¼	62	92	40½	64½	53	467,500	3,831,500	Cont. Can	No	1,714,000	2.50	1928	4.35	7.55
123½	123⅜	126	115	128	123		2,280	pfd	100	49,000	7%	1928	135.66	86.82
104¼	102	126⅜	82	94	64⅜	458,700	2,061,300	Corn Products	25	2,530,000	3.00	6 mo.	2.36	4.35
140	139⅜	144½	138½	146⅜	138½	3,240	28,760	pfd	100	250,000	7%	6 mo.	27.46	50.98
37⅜	37	69¼	21½	68⅜	34⅜	149,800	1,407,300	Davison Chem	No	504,000	...	1928	1.58	0.01
39	38	64⅞	33	61	40	11,800	168,000	Devoe & Rayn A	No	160,000	2.40	6 mo.	†2.87	†5.95
112	...	115½	112	120	108	580	2,970	1st pfd	100	16,000	7%	6 mo.	31.54	64.02
113½	113	119¾	111	121½	114	13,600	71,000	Dupont deb	100	978,000	6%	6 mo.	42.12	69.06
140	135	231	80	503	310	435,200	1,755,100	Dupont de Nemours	20	10,322,000	*4.00	6 mo.	3.84	5.97
209½	198	264½	162	194½	163	408,500	875,500	Eastman Kodak	No	2,069,000	*5.00	1928	9.60	9.61
120	...	128	120	132½	123½	50	2,910	pfd	100	61,657	6%	1928	326.17	326.68
200	200	315	195	230	120	1,100	8,300	Fed. Mining & Smelting	100	50,400	...	6 mo.	25.61	24.15
36	34	54⅞	24	109½	43	93,500	796,800	Freeport Texas	No	729,844	4.00	9 mo.	3.76	4.49
54½	52	94⅜	47	94⅜	141½	112,500	984,600	General Asphalt	100	238,000	...	6 mo.	1.41	2.79
115	110½	138	104½	150	132	2,000	44,200	pfd			5%	6 mo.	d6.97	13.89
45	38	64⅛	26	37	20⅜	137,200	1,351,800	Glidden Com	No	676,000	*2.00	9 mo.	2.79	3.55
100½	100	106½	99	105	95	910	7,800	prior pfd	100	74,000	7%	9 mo.	26.46	32.69
51¾	46	82	31½	143½	71	1,033,200	5,384,900	Gold Dust	No	1,764,000	2.50	1928	1.33	0.82
90	90	130	90	380	192		4,470	Hercules Powder	No	566,000	3.00	6 mo.	2.73	22.04
...	...	...	...	125	118½		1,280	pfd	100	114,241	7%	6 mo.	17.80	35.35
56	54	79½	40	84	64½	49,800	137,700	Household Prod.	No	575,000	*3.50	6 mo.	2.64	5.22
5½	5½	17⅞	4	20⅜	13	25,300	187,700	Intern. Agri	No	444,000		1928	1.66	
58	58	88½	53	85	48⅜	2,400	20,900	pfd	100	100,000	7%	1928	14.47	3.52
42	39	72⅜	26	46	41½	1,844,400	14,229,100	Intern. Nickel	No	11,789,000	1.00	6 mo.	0.75	1.05
53⅜	53⅜	68⅜	43⅜	60	47⅜	35,600	147,600	Int. Print Ink	No	273,000	2.50	6 mo.	3.55	2.96
70	70	90	55⅞	69	49½	660	74,960	Intern. Salt	100	60,771	...	6 mo.	3.80	7.23
148⅛	139	242⅜	107½	202	96½	417,600	3,032,300	Johns-Manaville	No	750,000	3.00	6 mo.	3.70	6.75
62½	54	113¼	40	124½	63½	78,900	684,300	Liquid Carbonic Corp	No	311,000	4.00	8 mo.	2.51	8.11
...	...	46	30	57⅜	45	6,800	61,100	Mac and Forbes	No	384,000	*2.60	6 mo.	1.46	3.30
49	45	72⅛	29½	190	117½	219,100	772,380	Mathieson Alk	No	581,000	2.00	6 mo.	1.78	4.35
125	123	125	120	130	115	90	3,110	pfd	100	28,000	7%	6 mo.	45.15	84.50
38	34	54½	20	33	17⅛	99,500	1,651,200	Miami Copper	5	747,116	4.00	1928	1.96	1.53
72½	65	80½	60	...	...		5,025	Monsanto Chem	33⅓	111,000	1.25	6 mo.	5.13	7.52
35⅜	33	58	15	58½	29½	83,000	957,700	National Dist. Prod.	No	168,000	...	6 mo.	2.99	...
...	...	...	...	...	...		243,900	pfd. tem. ctfs	...	...	...			...
160	151	210	132	136	115	45,600	241,440	National Lead	100	309,831	5%	1928	11.45	8.40
90	62	103	43			23,600	155,000	Newport Co	50	130,000	3.00	6 mo.	5.47	5.55
39⅛	38	60⅞	30	41½	22⅛	66,100	658,100	Penick & Ford	No	433,773	...	6 mo.	2.00	3.15
260	250	404	208	217	157	19,500	180,000	Peoples Gas Chi	100	566,000	8%		11.40	11.77
32½	30	45	30	9½	6½	28,800	2,264,400	Spencer Kellogg	No	500,000	1.60		3.59	2.37
63	57	94	42	71½	37	344,100	590,900	St Joseph Lead	10	1,952,000	*2.00	1928	2.96	2.71
71⅛	67	83	4	59⅜	37½	3,550,500	12,310,100	Standard Oil Co. of N. J.	25	24,835,000	*1.00	1928	4.43	1.52
40	38½	48½	32½	45½	28⅜	780,200	6,721,700	Standard Oil Co. of N. Y.	25	17,364,000	1.60	1928	2.28	0.67
15	13½	20⅜	10	19½	10½	84,300	1,059,900	Tenn. Cop. & Chem	No	857,000	1.00	1928	1.48	0.51
62⅜	59⅜	85½	45	82½	62½	418,500	3,707,500	Texas Gulf Sulfur	No	2,540,000	4.00	6 mo.	2.93	5.72
100	94½	140	66	209	186½	1,342,400	5,284,800	Union Carbide	No	8,565,000	2.40	6 mo.	1.75	3.71
158½	140½	243⅜	125⅛	138	102½	359,200	1,796,700	U. S. Ind. Alc	No	246,000	6.00	6 mo.	5.30	10.29
...	...	...	...	125⅞	118⅜		860	pfd	100	60,000				36.03
65	59½	116½	48	111⅜	60	152,800	1,773,200	Vanadium Corp	No	378,000	*3.00	6 mo.	3.13	4.53
7¼	7¼	24⅞	7½	20⅜	12	72,200	616,300	Virginia Car. com	No	479,000	...			0.69
24½	22½	65½	15⅛	64¼	44⅜	23,600	135,920	6% pfd	100	213,392	...		3.06	d7.57
75	71	97½	70	99⅛	88½	7,900	18,900	7% pfd	100	144,000	7%		12.35	d20.09
								NEW YORK CURB						
20	19¾	23	6	31½	16½	12,500	35,600	Acetol Prod	No	60,000		1928	2.27	
24	24	43½	23⅞	42⅜	33¼	6,300	47,700	Agfa Ansco	No	300,000	...			
299	295	539½	146	197½	120	12,400	94,650	Aluminum Co. of America	No	1,472,625	...	1928	8.03	5.00
106½	106½	108½	103½	110½	104	6,800	30,500	pfd	100	1,472,625	6%	1928	14.04	10.26
34⅞	30⅛	69½	28⅛	65	30⅜	483,675	1,689,675	Amer. Cyan	No	66,000	1.60		1.56	†3.68
25⅜	19½	37	19⅛	28½	11⅜	7,200	170,200	Amer. Sol. & Chem. com	No	180,000	...			
...	...	42½	25⅛	47¼	25½	3,200	82,400	pfd	No	113,000	...			
26	18	45⅞	15	54	26½	13,300	169,900	Anglo Chile Nitrate	No	1,756,750	...			...
5⅛	5⅛	10⅞	4½	33⅜	7	21,300	131,800	Br. Celanese	10s	2,300,000	...			...
...	...	...	...	46½	41	100	1,400	Canad. Ind. Alc	No	969,000	1.52	1928	†2.87	†2.49
30⅛	30	57½	20	103	36⅛	13,900	131,100	Celanese Corp. of Am	No	1,000,000	...	1928	0.67	1.72
...	...	...	...	122	34	600	5,500	Celluloid Co	No	194,952	...	1928	1.29	0.86
73	65¼	90	46½	92	75	47,800	114,500	Colgate-Palmolive Peet		2,000,000	2.60	1928	2.65	2.10
15½	15	25½	12	...	...	4,000	49,100	Courtaulds	£1	24,000,000		1928	19.88%	34.88%
...	...	...	...	24⅛	20			Am. dep-rects	...	...	...			...

1929 Oct. 31 High	1929 Oct. 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Oct.	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1929		1927
25	21⅛	41⅛	17⅛	23	7⅛	2,100	17,400	Heyden Chem.	10	150,000	...	1928	2.02	1.02
...	...	...	...	...	...	800	2,600	Imperial Chem. Ind.	£1	3,364,000		1928	26.70%	25.36%
...	...	...	...	98	38½	100	2,200	Monroe Chem.	No	100,000	1.50	6 mo.	0.98	
...	...	...	...	...	...	75	375	Penn Salt	50	150,000	5.00		8.27	8.09
8	8	10⅛	6½	9⅜	6½	5,800	49,700	Pyrene Mfg.	10	219,470	.80	1928	1.00	0.70
...	...	...	...	...	...	350	6,950	Sherwin Williams	20	594,445	4.00		6.99	6.42
...	...	48¼	20⅛	111½	103	45,900	529,300	Silica Gel	No	600,000	...			
...	...	...	...	92	65⅛	400	1,500	Snia Viscosa	120 lire	8,333,333	...	1928	7.22%	2.01%
...	...	...	...	29	17			dep-recpts	...	...	...			...
128½	128½	149⅞	123½	10	5⅞	5,600	43,200	Swift & Co.	100	1,500,000	8%	1928	9.29	8.13
220	200	550	150	42	31½	3,540	24,135	Tubize "B"	No	78,858	10.00			
...	...	61½	30	150½	125	14,300	92,600	United Chem., pfd.	50	120,000	3.00			
...	...	...	...	630	450		151,740	com.	No	102,000				
72	63	91⅛	48	100	53⅜	16,400	283,800	U. S. Gypsum	20	760,000	1.60	6 mo.	2.69	7.21
...	...	...	...	...	...		21,500	Westvaco Chlorine Prod.	No	200,000	2.00		3.60	
								CLEVELAND						
145	145	145	96¼	147½	104	1,244	24,371	Cleve-Cliff Iron	No	400,000	4.00			9.74
...	...	...	...	225	112½	205	1,977	Dow Chem.	No	1,000,000	6.00			
...	...	...	...	107	103⅜	100	784	pfd.	100	30,000	7%			
...	...	...	...	...	...			Glidden	No	500,000	*2.00		3.37	2.88
...	...	105	102½	104¾	96	145	2,865	prior pfd.	100	69,167	7%	9 mo.	26.46	32.69
83½	82	105	80	95	65½	3,850	19,130	Sherwin Williams	25	594,445	3.00	1928	6.99	6.42
106	105½	108	104	109½	106	573	6,170	pfd.	100	125,000	6%		39.21	37.82
...	...	...	...	28	24⅛	325	2,569	Wood Chemical Prod. "A"	No	20,000	2.00			7.75
								CHICAGO						
...	...	...	...	96	91½	600	21,650	Monroe Chem.	100	167,500	...			4.74
68	67	80½	48	146	127½	8,445	75,772	Monsanto Chem.	No	300,000	1.25	6 mo.	5.13	7.52
131	130½	145	124½	...	..	16,300	85,050	Swift & Co.	100	1,500,000	8%	1928	9.87	8.13
67⅛	64½	92½	45⅝	...	...	78,380	430,830	U. S. Gypsum	20	812,000	1.60	6 mo.	2.69	7.21
...	...	...	...	100	55		67,150	United Chemicals, pfd.	No	120,000	3.00		1.57	
								CINCINNATI						
76	73	100	65	300	249	26,398	72,112	Proc. & Gam.	20	1,250,000	8.00		11.96	11.38
								PHILADELPHIA						
101	101	116	89	109½	92	7,400	31,700	Penn. Salt	50	150,000	5.00		10.64	8.27
38	35	59⅜	26	173½	114½	944,200	2,824,028	United Gas Imp.	No	3,999,000		1928	1.36	0.67
								MONTREAL						
4	4	...	...	...	...	2,801	39,257	Asbestos Corp.	No	200,000	...			0.87
17	17	...	...	...	...	740	11,555	pfd.	100	75,000	7%	1928	3.36	9.32
14	12	...	...	...	...	30,653	216,632	Canada Ind. Alc.	No	969,000	1.52	1928	†2.87	†2.49
...	...	...	...	...	...	100,671	653,303	Shawinigan W. & P.	No	1,867,000	2.00	1928	2.17	2.41
								BALTIMORE						
...	...	...	...	28¼	17	100	1000	Silica Gel	No	630,000	...			
								UNLISTED						
...	...	...	...	80	70			Agfa Ansco, pfd.	100	50,500	...			...
...	...	...	...	375	190			Hercules Powd., com.	No	147,000	14%	9 mo.	15.10	16.36
81	76	...	...	82	64			Merck. & Co., pfd.	100	33,950	...			...

The Industry's Bonds

1929 Oct. 31 High	1929 Oct. 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Oct.	Sales Since Jan. 1	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
105½	105	106½	103½	106¾	104	150	955	Am. Agri Chem.	1941	7½	F. A.	30,000
96½	...	93½	97½	97	92	184	1,285	Amer. Cyanid.	1942	5	A. O.	
109	135	95	...			1,814	3,892	Amer. I. G. Chem.				
98⅞	...	102	98	102¾	99¾	470	2,663	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
88	87	100	86	105½	92	191	2,597	Anglo Chilean	1945	7	M. N.	16,500
100½	100	103½	99¾	103¾	99⅞	179	1,206	Atlantic Refin.	1937	5	J. J.	15,000
99½	...	102	99	103½	100	41	287	By product Coke	1945	5½	M. N.	8,000
100¼	100	103	96½	103⅛	100	2	83	Corn Product Refin.	1934	5	M. N.	10,000
...	...	...	...	117	106	2	781	General Asphalt	1939	6	A. O.	5,000
95	93¼	95	90½	95⅞	89½	39	190	Int. Agric. Corp.	1932	5	M. N.	30,000
72	...	81½	72	86¼	77	57	153	Int. Agri. Corp. stamped. extended	1942	5	M. N.	7,020
90	...	104	90			1,400	3,052	Lautaro Nitrate				
102⅛	...	127	101⅜	...	...	168	1,533	Montecatini	1937	7	J. J.	
95	...	99½	93	...	...	178	1,669	Ex War	1937	7	J. J.	
100½	...	113	110	...	...	1	90	People s Gas & Coke	1943	6	A. O.	10,000
101¼	...	105⅜	100¼	108⅛	102	132	695	Refunding	1947	5	M. S.	40,000
101	100⅜	103⅛	100	104	102	980	5,080	Standard Oil N. J.	1946	5	F. A.	120,000
97	91½	110	89	120	101⅛	235	876	Tenn. Cop. and Chem.	1941	6	A. O.	3,000
73	69¼	82	68⅞	91⅛	82	14	124	Va. Iron C. & C.	1949	5	M. S	
								NEW YORK CURB				
99⅞	99⅞	102½	99⅛	103⅜	100	387	387	Alum. Co. of Am 52	1952	5	M. S.	
...	...	...	...	121⅛	98		2,357	Amer. Com. Alc.	1943	5	M. N.	
...	...	...	...	125	99	141	1,640	Amer. Solv. & Chem.	1936	6	M. S.	
...	...	100½	93	101⅛	97½	253	2,573	Koppers Gas and Coke	1947	5	J. D.	25,000
...	...	...	...	103½	98		343	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
92	91½	94⅛	88½	98⅞	93½	126	1,459	Shawinigan W & P	1967	4½	A. O.	
...	...	112¼	98	106⅛	100	17	555	Silica Gel. 6½% with warr.	1952	6½		
93⅜	91⅞	98⅜	90	100	95	98	2,583	Solvay Am. Invest. Corp.	1942	5	M. S.	15,00
98	98	100½	98	101½	99⅛	289	446	Swift & Co.	1932	5	A. O.	50,00
...	...	104	98	104	99½	26		Westvaco Chlorine Prod.	1937	5½	M. S.	2,50

Spot
or
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Cellulose Acetate
Stability - Low Acidity
Clarity - Uniformity

Acetic Anhydride
(90/95%)

Anhydrous
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Casein
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I. G.'s Working Agreement With Russian Chemical Industry Expires

I. G. Farbenindustrie A.-G. and the Russian chemical industries' three-year working agreement made on September 21, 1926, has now expired. Under the terms of this agreement the I. G. was to afford ample technical help for the development of the Russian chemical industry in consideration of favourable treatment in Russia's chemical import trade. According to a statement made by the Russian Trade Delegation in Germany, the latter are of the opinion that the technical help given by the Germans has not come up to expectations, and they are unwilling to renew the trade agreement on the old terms. There is much doubt, however, that a renewal of the agreement, if perhaps somewhat modified, will be made, especially in the light of a report which the Central Soviet Committee has recently made on the position of the Northern Chemical Trust (Sewchimtrust). In this report the Chemical Trust is adversely criticized on the ground of poor progress, and the recommendation is made that every effort should be made to attract further technical experts and consultants into the Russian chemical industry.

In the mean while the German interests are withholding any information as to the difficulties encountered. German economic circles do not welcome a break between the Soviet Government and the dye interests, as it undoubtedly would further accentuate the falling German exports to Russia.

During the first half of 1929 these shipments amounted to only £8,250,000, compared with almost £11,000,000 in the first half of 1928 and with £9,300,000 during the second half. German chemical exports to Russia, which would be adversely affected in the event of a break, amounted to nearly £1,900,000 this year.

Canadian Industries to Make Fertilizer

Canadian Industries, Ltd., announces that following an exhaustive survey and study of the fertilizer market in Canada, it has decided to embark upon a comprehensive program for the manufacture and distribution of fertilizers on a large scale.

While Canadian Industries, Ltd., through its subsidiary, Triangle Chemical Co. of British Columbia, is to-day the only active manufacturer of superphosphates in Canada, the new program will probably result in the immediate construction of factories at Hamilton, Ontario, and Belocil, Quebec. In these factories will be manufactured superphosphate and fertilizing mixtures adapted to soil and crop conditions in the respective provinces.

Consistent with the usual Canadian Industries, Ltd., practice, the operations of the fertilizer division will be correlated with those of the other Canadian Industries, Ltd., divisions, so insuring greater initial efficiency. In the conduct of this, as in the case of other divisions, Canadian Industries, Ltd., will have the technical and commercial backing of Imperial Chemical Industries, Ltd.

Aluminum chloride's prevailing low prices in this country is said to be interesting French and German chemical companies. Their reaction is that its use might be considerably enlarged by its adoption for the rapidly developing oil refining industry and various synthetic uses for which it is known to be useful or will be adapted to, depending upon its price.

Aron Hirsch & Son, Halberstadt, have taken over the exclusive German agency of the Spanish-Italian quicksilver cartel, Lausanne, Switzerland. Heretofore, quicksilver from this combined source was sold in Germany by the Metallbank, Frankfurt, and the Aron Hirsch firm.

Shipments of Moroccan phosphates during the first six months of 1929 amounted to 756,746 metric tons, as compared with 644,810 tons during the same period of 1928.

The Trend of Prices

Industry Shows Increased Activity Over October of Last Year

Abnormal Conditions In Stock Market As Yet Fail To Be Reflected In Industry Generally—Chemical Business Continues Ahead of Last Year—Weakness Developing In Acetone Market—Chlorine Prices Lowered—Oxalic Continues Scarce and Strong.

Although abnormal conditions prevailed at the close of October, due to unsettled conditions in the stock market, industry and business generally showed an increase in activity over October of last year, although activity increased less during the month than is usual for this season of the year. Industrial production in September continued above the level of a year ago, and for the third quarter of the year, was at a rate approximately 10 per cent above 1928, the Federal Reserve Board announced.

Activity, however, increased less during the month than is usual at this season. There was a further decline in building contracts awarded, while bank loans increased between the middle of September and October 15, reflecting chiefly a growth of loans on securities.

In this period the increase in the volume of loans and investments of member banks in leading cities was slight. The banks' loans on securities increased rapidly, while all other loans, including those for commercial and agricultural purposes, declined somewhat after reaching a seasonal peak on October 20. Security holdings of reporting banks continued the decline which has been almost uninterrupted for more than a year.

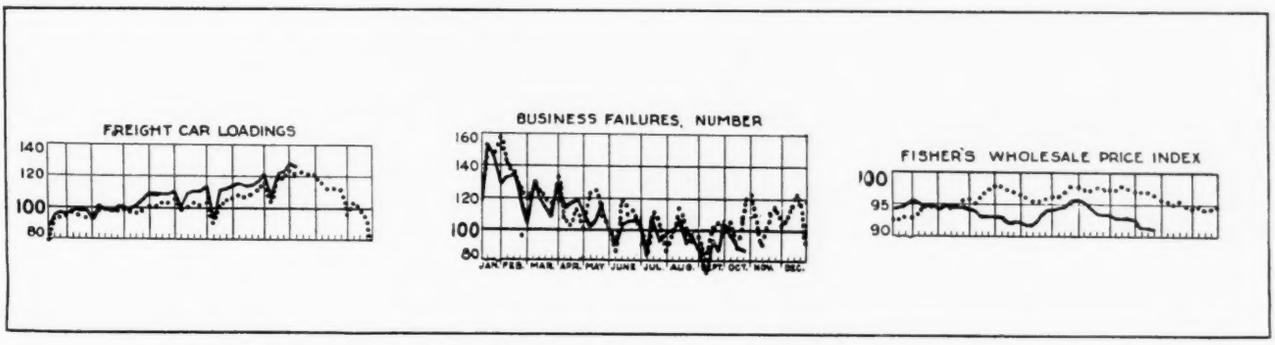
Wholesale prices showed little change from August to September. Prices of meats and live stock declined considerably, while those of grain advanced. The prices of raw silk, cotton and cotton goods were higher in September, and the price of coal increased, while prices of iron and steel products, tin, gasoline and cement were lower. During the first three weeks of October, prices declined for a considerable number of commodities, including wheat, flour, hides, steel, tin, cotton, silk and wool.

Output of iron and steel declined further in September contrary to the seasonal tendency; there was a sharp decrease in output of automobiles and automobile tires, and a smaller than seasonal increase in activity in the textile and shoe industries, which continued to produce at a high rate in comparison with the preceding year. Meat packing plants were more active than in August. Factories increased the number of their employes during September, and pay rolls were also slightly larger.

Freight car loadings increased by slightly less than the usual seasonal amount in September and continued to be larger than a year ago. In the first two weeks of October car loadings were smaller than in the corresponding weeks of 1928.

Generally speaking, the chemical business continues in flourishing condition. The past month has been, in almost every case, better than the corresponding period of last year, which in turn was an extremely good year. Taking the alkalis as a general index, it is found that the market is strong in every sense and with fewer disturbing influences than ever before. Shipments continue to increase in volume over those of last year. There has been some lessened activity in those chemicals going into the lacquer trade due to the curtailment of automobile production. In some quarters there is a tendency to blame this upon the stock market decline, but it must be pointed out that automobile production had been curtailed before the stock market crash in the latter days of the month.

A real accumulation of stocks is taking place in the acetone market due to greatly increased production. Some price shading has already been in evidence on large business and a decline in price seems inevitable. Chlorine prices are lower, and it is predicted that the opening of the contract season on ammonia will find prices higher. Supplies of oxalic are short, prices have advanced and imports are increasing tremendously due to heavy demand from the coal industry. Fertilizer activity continues at a standstill and the oils and fats market seems in a definitely stronger position following the lead of linseed which bids fair to sell at high prices for some time to come.



Business indicators prepared by the Department of Commerce. The weekly average 1923-25 inclusive = 100. The solid line represents 1929 and the dotted line 1928.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

Acetone — Increasing growth of accumulated stocks begins to point towards a definitely downward tendency in this market. At present the demand seems to lag behind supply, with the result that prices appear to be heading downward. A cetone exports from the United States during the first nine months of the present year amounted to 6,159,663 pounds, valued at $563,781. Of the total, nearly two-thirds, or $363,700 worth, went to the United Kingdom, although no shipments were made in August or September. Other principal takers during the three-quuarter period of 1929 were Canada, $51,200; Belgium, $50,200; Cuba, $33,400; Japan, $17,900, and Australia, $15,800. The removal of the United Kingdom as an export market, together with greatly increased production have combined to bring the present weakness into the domestic market, with keen competitive conditions prevailing.

Acid Acetic — For the first time in many months, producers are a bit ahead on this material. Producers say that lacquer manufacturers have eased up in their demand with the result that acetic producers now have an opportunity to build up some stocks. The slackened lacquer demand is attributed to a falling off in car manufacture, which in turn is attributed to the hectic conditions of the past month in the stock market. Thus acetic acid is one of the first chemicals to report any slackening of demand which might be occasioned by the stock market conditions. Imports of acetic acid into the United States during August amounted to 2,359,489 pounds valued at $162,494, bringing the total for the first eight months of 1929 to 20,501,134 pounds, value $1,521,567. This is 12 per cent more in quantity (11 per cent in value) than imports, entered for consumption, during the entire year of 1928. Increased consumption of acetic acid is also seen in production data, a 16 per cent gain in 1927 being noted over 1925, the preceding census year. Production in 1925 amounted to 65,591,553 pounds, valued $4,437,622, increasing in 1927 to 76,432,005 pounds, value $5,523,752.

Acid Cresylic — Cresylic acid imports into the United States, entered for con-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.26	.18½	.24	.24	Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.21	.18½
				Acetaldol, 50 gal dr.....lb.	.27	.31	.31	.27
.24	.23	.20	.20	Acetanilid, tech, 150 lb bbl...lb.	.23	.24	.24	.23
.35	.29	.29	.29	Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.29	.35	.35	.29
.....	.....	.38	.32	Acetin, tech drums.....lb.	.30	.32	.32	.30
.15	.13	.12	.12	Acetone.....lb.	.12	14	.16	12
1.75	1.65	1.65	1.65	Acetone Oil, bbls NY.....gal.	1.15	1.25	1.25	1.15
.45	.42	.42	.42	Acetyl Chloride, 100 lb cby...lb.	.55	.68	.68	.45
				Acetylene Tetrachloride (see tetrachlorethane).....				
				Acids				
				Acid Acetic, 28% 400 lb bbls				
3.88	3.38	3.38	3.38	c-1 wks.....100 lb.	.....	3.88	3.88	3.88
13.68	11.92	11.92	11.92	Glacial, bbl c-1 wk.....100 lb.	.....	13.68	13.68	13.68
1.00	.98	.98	.98	Anthranilic, refd, bbls.....lb.	.98	1.00	1.00	.98
.80	.80	.80	.80	Technical, bbls.....lb.	.....	.80	.80	.80
2.25	1.60	1.60	1.25	Battery, cbys.....100 lb.	1.60	2.25	2.25	1.60
.60	.57	.57	.57	Benzoic, tech, 100 lb bbls....lb.	.57	.60	.60	.57
.11	.08¼	.08¼	.08¼	Boric, crys. powd, 250 lb. bbls.....lb.	.05¼	.06¼	.06½	.05¼
1.25	1.25	1.25	1.25	Broenner's, bbls.....lb.	.....	1.25	1.25	1.25
.90	.85	.85	.80	Butyric, 100% basis cbys.....lb	.85	.90	.90	.85
4.85	4.85	4.90	4.85	Camphoric.....lb.	.....	4.85	4.85	4.85
.28	.13	.25	.25	Carbolic, 10%, 50 gal bbls....lb.	.13	.14	.14	.13
.16	.15	.15	.15	Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.05½	.04½
.30	.25	.37	.25	Chromic, 99%, drs extra.....lb.	.17½	.19	.23	.17½
1.06	1.00	1.00	1.00	Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.06	1.00
.44½	.59	.44½	.43	Citric, USP, crystals, 230 lb. bbls.....lb.	.46	.59		.46
.97	.95	.95	.95	Cleve's, 250 lb bbls.....lb.	.52	.54	.59	.52
.70	.68	.60	.57	Cresylic, 95%, dark drs NY..gal.	.60	.70	.54	.60
.72	.72	.70	.60	97-99%, pale drs NY.....gal.	.72	.77	.77	.72
.12	.11	.11	.10	Formic, tech 90%, 140 lb. cby.....lb.	.11½	.11½	.11½	.10½
.55	.50	.50	.50	Gallic, tech, bbls.....lb.	.50	.55	.12	.50
.74	.74	.74	.69	USP, bbls.....lb.	.....	.74	.55	.74
1.06	1.00	1.00	1.00	Gamma, 225 lb bbls wks.....lb.	.80	.85	.74	.74
.63	.57	.57	.57	H, 225 lb bbls wks.....lb.	.65	.70	.99	.80
.67	.67	.67	.65	Hydriodic, USP, 10% soln cby lb.	.....	.67	.72	.67
.48	.45	.45	.45	Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.67 .48	.45
				Hydrochloric, CP, see Acid Muriatic.....			.....	.....
.90	.80	.80	.80	Hydrocyanic, cylinders wks...lb.	.80	.90	.90	.80
.06	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06	.06
.11	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	.....	.11	.11	.11
.85	.85	.85	.85	Hypophosphorous, 30%, USP, demijohns.....lb.	.....	.85	.85	.85
.06	.04½	.05½	.05½	Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.05½	.04½
.13½	.12	.13	.13	44%, light, 500 lb bbls.....lb.	.11	.11½	.12½	.11
.54	.52	.52	.52	Laurent's, 250 lb bbls.....lb.	.40	.42	.42	.40
60	.48	.....	.....	Malic, powd., kegs.....lb.	.48	.60	.60	.48
.65	.60	.60	.60	Metanilic, 250 lb bbls.....lb.	.60	.65	.65	.60
.08	.07½	.07½	.07½	Mixed Sulfuric-Nitric..... tanks wks.....N unit	.07	.07½	.07½	.07
.01½	.01	.01	.01	tanks wks.....S unit	.008	.01	.01	.008
.21	.18	.21	.18	Monochloroacetic, tech bbl..lb.	.18	.21	.21	.18
.65	.65	1.65	1.65	Monosulfonic, bbls.....lb.	1.65	1.70	1.70	1.65
1.40	1 35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	.....	1.35	1.40	1.35
				tanks, wks. 100 lb.		1.00	1.00	1.00
1.80	1.70	1.70	1.70	20 degrees, cbys wks...100 lb.	.....	1.45	....	1.45
.95	85	.95	.95	N & W, 250 lb bbls.....	.85	.95	.95	.85
.59	.55	.55	.55	Naphthionic, tech, 250 lb.....	.....	Nom.	.59	.55
5.00	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00	5.00
6 00	6.00	6.00	6.00	40 deg, 135 lb cbys, c-1 wks.....100 lb.	.....	6.00	6.00	6.00
.11½	.10½	.11½	.11	Oxalic, 300 lb bbls wks NY...lb.	.11½	.11½	.11½	.11
.08½	.08	.08	.07	Phosphoric 50%, 150 lb cby..lb.	.08	.08½	.08½	.08
.16	.16	.19	16	Syrupy, USP, 70 lb drs....lb.	.....	.16	.16	.16
.50	.50	.50	.50	Picramic, 300 lb bbls.....lb.	.65	.70	.70	.65
.50	.40	.45	.30	Picric, kegs.....lb.	.40	.50	.50	.40
.86	.86	.86	.86	Pyrogalic, technical, 200 lb bbls.....lb.	.....	.86	.86	.86
.32	.27	.27	.27	Salicylic, tech, 125 lb bbl.....lb.	.37	.42	.42	.37
.16	.15	.15	.15	Sulfanilic, 250 lb bbls.....lb.	.15	.16	.16	.15
1.95	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95	1.95	1.60
				tanks, wks. ton		15.50	15.50	15.50
1.37½	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	1.50	1.65	1.65	1.50
1.12½	1.12½	1.10	1.10	60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.42½	1.27½
1.52½	1.52½	1.50	1.50	Oleum, 20%, 1500 lb. drs 1c-1 wks .....100 lb.	.....	1.52½	1.52½	1.52½

AS CONTRACT TIME APPROACHES

From year to year, at this time, there is a growing disposition . . . a healthy resolve . . . among consumers of Chemicals in Bulk, toward the adoption of Isco Chemicals as a standard for Industrial and kindred purposes.

Additional to this . . . and supporting testimony to a sustained uniformity of the products we offer . . . whether manufactured in our own plants or selected from other established sources . . . there comes to us throughout the year, evidence of a sincere regard for the highly developed elements of Service shared by all who entrust their Chemical requirements to our care.

There is no seasonal exercise of Isco Service . . . it is perennial! However, we remind you of the rapidly approaching Contract Season.

LET US QUOTE ON YOUR REQUIREMENTS

GUMS
CHLORINE
FORMIC ACID
ZINC CHLORIDE
NITRITE OF SODA

CARBONATE OF POTASH
BLEACHING POWDER
BUTYL PROPIONATE
CAUSTIC POTASH
BICHROMATES
(Soda and Potash)
SODA ASH

SILICA
WAXES
LARVACIDE
NAPHTHALENE
(Flake or Balls)

INNIS, SPEIDEN & CO.

INCORPORATED

117-119 LIBERTY STREET, NEW YORK.

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"OVER A CENTURY OF SERVICE AND PROGRESS"

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

sumption during the first seven months of 1929, showed an increase of 36 per cent over the quantity imported in the same period of 1928. Imports of unrefined cresylic acid January-July, 1928, aggregated 6,458,849 pounds, increasing to 8,839,117 pounds in the corresponding period of 1929. Imports for consumption of cresylic acid (75 per cent distilling below 215 degrees C.) more than quadrupled in the period January-September, 1929, against the same period in the preceding year. There were entered for consumption 1,222,414 pounds during the first three quarters of 1929, compared with 273,632 pounds in the corresponding 1928 period.

Acid Oxalic — Continued strength in this market has resulted in advances in price to 11¼c @ 11½c lb. during the past month. Producers are unable to keep up with demand and a good portion of production is sold up for the balance of the year. Imports continue to increase with figures for August amounting to 84,475 pounds, more than twice that of July.

Alcohol — Prices seem to have assumed a definitely upward tendency in this market although conditions during the past month have been quite routine. It is reported that the market is very strong and an increase in price seems not unlikely.

Ammonia — Producers are awaiting the opening of the contract season about the middle of November. It is reported that the outlook is strong and in most quarters higher prices are expected.

Ammonium Chloride — This item continues to move in surprising volume considering the tendency towards electrification of radio sets. This, of course, is the period of big demand and sales for September and October are reported to be well ahead of last year.

Ammonium Sulfate — Activity here as in most fertilizers, has been practically at a standstill. Both export demand and spot business has been absent and the only movement consisted in withdrawals against contracts.

Antimony — The past month has been quiet and steady, characterized by lack of buying interest. Towards the end of the month unsettled conditions in China brought a stronger tone into the market, but thus far, prices remain as previously quoted.

Arsenic — Imports of white arsenic during 1928 amounted to 11,153 short tons, valued at $775,169 as compared to 12 tons valued at $921,998 in 1927. For the first eight months of this year imports

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
42.00	42.00	42.00	42.00	40%, 1c-1 wks net ton	.....	42.00	42.00	42.00
.40	.30	.30	.30	Tannic, tech, 300 lb bbls lb.	.30	.40	.40	.30
.38	.34½	.37	.29½	Tartaric, USP, crys, powd, 300 lb. bbls lb.	.38	.38½	.38½	.38
.85	.85	.85	.85	Tobias, 250 lb bbls lb.	.....	.85	.85	.85
2.75	2.75	2.75	2.00	Trichloroacetic bottles lb.	.....	2.75	2.75	2.75
2.00	2.00	2.00	2.00	Kegs lb.	.....	2.00	2.00	2.00
1.25	1.00	1.00	1.00	Tungstic, bbls lb.	1.40	1.70	2.25	1.00
.55	.43	.45	.45	Albumen, blood, 225 lb bbls lb.	.43	.47	.47	.43
				dark, bbls., lb.	.12	.20	.20	.12
.84	.78	.95	.80	Egg, edible lb.	.74	.77	.83	.70
.80	.70	.92	.77	Technical, 200 lb cases lb.	.70	.75	.80	.70
.65	.60	.60	.60	Vegetable, edible lb.	.60	.65	.65	.60
.55	.50	.50	.50	Technical lb.	.50	.55	.55	.50
				Alcohol				
.20	.18½	.20	.19	Alcohol Butyl, Normal, 50 gal drs c-1 wks lb.	.17½	.18½	.17½	.17½
.19½	.18½	.20½	.19½	Drums, 1-c-1 wks lb.	.17½	.18½	.18½	.17½
.19	.17½	.19½	.18½	Tank cars wks lb.	.16½	.17½	.17½	.16½
2.25	1.75	.....	.....	Amyl (from pentane) drs c-1 wks gal.	.....	1.67	1.67	1.67
1.80	1.70	1.70	1.70	Diacetone, 50 gal drs del gal.	1.70	1.80	1.80	1.70
3.70	2.65	3.70	3.70	Ethyl, USP, 190 pf, 50 gal bbls gal.	.....	2.69½	2.69½	2.69½
.55	.50	.50	.50	Anhydrous, drums gal.	.....	.71	.71	.71
.52	.48½	.52	.37½	Completely denatured, No. 1, 190 pf, 50 gal drs drums extra gal.	.....	.52	.52	.49
.50	.43	.50	.29	No. 5, 188 pf, 50 gal drs. drums extra gal.	.....	.51	.51	.48
.46	.41	.46	.25	Tank, cars gal.	.....	.49	.49	.46
1.25	1.00	1.00	1.00	Isopropyl, ref, gal drs gal.	1.05	1.30	1.30	1.00
1.00	1.00	1.00	1.00	Propyl Normal, 50 gal dr. gal.	.....	1.00	1.00	1.00
.82	.80	.80	.80	Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.82	.80
.65	.65	.65	.65	Alpha-Naphthol, crude, 300 lb bbls lb.	.....	.65	.65	.65
.37	.35	.35	.35	Alpha-Naphthylamine, 350 lb bbls lb.	.32	.34	.34	.32
3.30	3.25	3.25	3.15	Alum Ammonia, lump, 400 lb bbls, 1c-1 wks 100 lb.	3.25	3.30	3.30	3.25
5.50	5.25	5.25	5.25	Chrome, 500 lb casks, wks 100 lb.	5.00	5.25	5.50	5.00
3.20	3.10	3.50	3.10	Potash, lump, 400 lb casks wks 100 lb.	3.00	3.10	3.20	3.00
5.50	5.25	5.25	5.25	Chrome, 500 lb casks wks 100 lb.	5.25	5.50	5.50	5.25
3.75	3.75	3.75	3.75	Soda, ground, 400 lb bbls wks 100 lb.	.....	3.75	3.75	3.75
26.00	24.30	27.00	26.00	Aluminum Metal, c-1 NY 100 lb.	.....	24.30	24.30	24.30
.40	.35	.35	.35	Chloride Anhydrous, 275 lb drums lb.	.....	.05	.40	.05
.18	.17	.17	.17	Hydrate, 96%, light, 90 lb bbls lb.	.17	.18	.18	.17
.24	.18	.23	.23	Stearate, 100 lb bbls lb.	.25	.26	.26	.25
1.75	1.75	1.75	1.75	Sulfate, Iron, free, bags c-1 wks 100 lb.	1.95	2.05	2.05	1.95
1.40	1.40	1.40	1.35	Coml, bags c-1 wks 100 lb.	.....	1.40	1.40	1.40
1.15	1.15	1.15	1.15	Aminoazobenzene, 110 lb kegs lb.	.....	1.15	1.15	1.15
				Ammonium				
.14	.13½	.13½	.10	Ammonia, anhyd, 100 lb cyl. lb.	.14	.14	.14	.14
.03	.03	.03	.02½	Water, 26°, 800 lb dr del. lb.	.....	.03½	.03½	.03½
.22	.21	.21	.21	Bicarbonate, bbls., f.o.b. plant 100 lb.	.....	5.15	6.50	5.15
.09	.08½	.08½	.08½	Bifluoride, 300 lb bbls lb.	.21	.22	.22	.21
5.15	4.45	5.05	4.85	Carbonate, tech, 500 lb cs. lb.	.09	.12	.12	.09
5.75	5.25	.07	.05½	Chloride, white, 100 lb. bbls wks 100 lb.	4.45	5.15	5.15	4.45
.11½	.11	.11	.11	Gray, 250 lb bbls wks lb.	5.25	5.75	5.75	5.25
.16	.15	.15	.15	Lump, 500 lb cks spot lb.	.11	.11½	.11½	.11
.10	.06	.06	.06	Lactate, 500 lb bbls lb.	.15	.16	.16	.15
.38	.27½	.27½	.27½	Nitrate, tech, casks lb.	.06	.10	.10	.06
.18	.18	.18	.18	Persulfate, 112 lb kegs lb.	.26	.30	.34	.26
2.90	2.20	2.30	2.55	Phosphate, tech, powd, 325 lb bbls lb.	.12½	.13	.13	.12½
3.00	2.50	2.55	2.35	Sulfate, bulk c-1 100 lb.	2.10	2.20	2.40	2.05
				Southern points 100 lb.	2.10	2.20	2.45	2.05
60.85	60.85	59.70	56.85	Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f. ton	.....	53.50	60.85	52.40
.60	.55	.55	.55	Sulfocyanide, kegs lb.	.36	.48	.48	.36
2.25	1.72	2.25	1.90	Amyl Acetate, (from pentane) drs gal.	1.60	1.70	1.70	1.60
.....	.....	.....	.....	Tech., drs gal.	1.60	1.70	1.70	1 60
				Alcohol, see Fusel Oil				
				Furoate, 1 lb tins lb.		5.00		
.16½	.15½	.15½	.15	Aniline Oil, 960 lb drs lb.	.15½	.16½	.16½	.15½
.48	.41	.41	.41	Annatto, fine lb.	.34	.37	.37	.34
1.00	.90	.90	.90	Anthraquinone, sublimed, 125 lb bbls lb.	.80	.90	.90	.80
.12	.09½	.11½	.14	Antimony, metal slabs, ton lots lb.	.....	.08½	.10	.08½
.12	.10	.15½	.14	Needle, powd, 100 lb cs lb.	.....	.10	.10	.09
.18	.17	.17	.17	Chloride, soln (butter of) cbys lb.	.17	.18	.18	.17
.12	.09½	.16½	.16½	Oxide, 500 lb bbls lb.	.....	.08½	.10	.08½
.....	.....	.28	.25½	Salt, 66%, tins lb.	.25½	.26	.26	.25½
.20	.16	.20	.16	Sulfuret, golden, bbls lb.	.16	.20	.20	.16
.42	.38	.42	.37½	Vermilion, bbls lb.	.38	.42	.42	.38
.19	.17	.18	.18	Archil, conc, 600 lb bbls lb.	.17	.19	.19	.17
.14	.12	.12	.12	Double, 600 lb bbls lb.	.12	.14	.14	.12
.16	.15	.16	.14	Triple, 600 lb bbls lb.	.15	.16	.16	.15
.08	.08	.15	.12½	Argols, 80%, casks lb.	.....	.08	.08	.08
.16	.15	.08	.03	Coude, 30%, casks lb.	.15	.16	.16	.15
.11	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs. lb.	.09	.11	.11	.09
.04	.03½	.04	.03½	White, 112 lb kegs lb.	.04	.04½	.04½	.04
14.75	14.75	14.75	14.75	Asbestine, c-1 wks ton	.....	15.00	15.00	4.75

THE PRODUCTS
OF THE CARBIDE AND CARBON CHEMICALS CORPORATION

» ACETONE, C. P.
(B.P. 56.2° C), a synthetic product, used as a solvent for cellulose acetate, nitrocellulose and acetylene.

» ETHYLENE GLYCOL
(B.P. 197.2° C), a colorless, odorless liquid, completely miscible with water, used as a coolant in motors, in anti-freeze solutions for automobile radiators and in the manufacture of dynamites.

» CELLOSOLVE*
(B.P. 134.8° C), an excellent lacquer solvent, unusual for its lack of odor. It is also a solvent for basic and vat dyes and is used in this capacity to improve penetration and intensity.

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(B.P. 153° C), a lacquer solvent particularly useful under humid conditions because of its high resistance to blushing.

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(B.P. 170.6° C), a powerful solvent with a mild odor, suitable for brushing lacquers, useful in varnishes of the "4-hour" type to lower the viscosity.

» METHYL CELLOSOLVE*
(B.P. 124.5° C), a new high boiling solvent for cellulose acetate, excellently suited for use in cellulose acetate dopes, lacquers and rayons.

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(B.P. 245° C), an extremely hygroscopic liquid used as a moistening agent in the manufacture of composition cork, glue, paper, etc., and as a solvent for dyes and lubricant in the textile industry.

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(B.P. 198° C), an excellent solvent for dyes, nitrocellulose and resins, used in dye-printing, textile soaps and the manufacture of safety glass.

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(B.P. 222° C), a solvent for nitrocellulose and resins which, because of its very high boiling point, is used particularly for baking lacquers and pyroxylin dopes.

» ETHYLENE CHLORHYDRIN 42.3%
(B.P. 96° C), an interesting chemical used in the synthesis of various organic compounds and also for the treatment of dormant bulbs and tubers such as potatoes to force early sprouting.

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(B.P. 83.5° C), a solvent for fats and oils, used in textile soaps and dry cleaning. It is also a powerful fumigant suitable for both industrial and household use.

» DICHLOR ETHYL ETHER
(B.P. 178° C), a high boiling chlorinated solvent, similar to Ethylene Dichloride, useful in the textile and dry cleaning industries as spotting-out agent and in the formulation of textile soaps.

» TRIETHANOLAMINE
(B.P. 277-279° C at 15mm), a viscous, pale yellow liquid which combines readily with fatty acids to form organic soaps that are powerful emulsifying agents. Triethanolamine alone is used as a lubricant and moistening agent as well as solvent for casein, shellac and many organic substances.

*Trade-mark registered

CARBIDE AND CARBON CHEMICALS CORP.

30 East 42nd Street, New York City

Unit of Union Carbide UCC *and Carbon Corporation*

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

total 8,778 tons, valued at $607,128, about 1,200 tons above the corresponding period of 1928.

Beeswax — Although prices remain unchanged, conditions have improved considerably during the past month and the market seems considerably stronger and on the upturn as soon as buying interest develops.

Benzene — Demand continues very good both from domestic and foreign consumers. The export movement in benzol this year is well above last year in both quantity and value, a Department of Commerce summary reveals. Shipments of this leading coal tar crude during the eight months ended with August amounted to 22,562,965 gallons, valued at $5,857,000, as compared with 15,268,402 gallons, valued at $3,463,761 during the same period one year ago.

Blood — Demand has slackened during the month and as a result prices are lower with $4.35 per unit quoted at New York and $4.85 @ $5.00 at Chicago.

Borax — The large gains recorded in American borax exports since 1923 reached a record high figure of 68,000 tons in 1928, valued at $3,454,171. The foreign markets for 85 to 90 per cent of the American borax are in the European countries, and 8 to 10 per cent in the Far East.

Calcium Acetate — Although production has not as yet increased, the situation seems a bit easier, probably because of slackened demand from producers of acetic acid. Ethyl acetate is slowing off and there has been some curtailment in automobile production.

Calcium Chloride — Demand during September and October has shown considerable improvement over that for the corresponding months of last year. This is almost wholly attributed to the demand from the coal industries, who use the material for producing a dustless coal.

Carnauba Wax — Competition in the domestic market continues to bring lower prices despite the fact that there are little offerings originating in Brazil. Nevertheless the past month has witnessed a further lowering of prices with Flor at 35c @ 36c lb., No. 1, yellow, at 34c lb., No. 2 regular, at 31c lb., No. 3, N. C., at 24c lb., and No. 3 chalky at 24c lb. Of the approximate 9,500,000 pounds of vegetable wax imported into the United States in 1928, valued at $2,237,000, the

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Barium			
57.00	47.00	47.50	47.50	Barium, Carbonate, 200 lb bags wks....ton	58.00	60.00	60.00	57.00
.12½	.12	.12	.12	Chlorate, 112 lb kegs NY..lb.	.14	.15	.15	.14
65.00	54.00	65.00	57.50	Chloride, 600 lb bbl wks...ton	65.00	69.00	69.00	63.00
.13½	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.12	.13	.13	.12
.04½	.04½	.04½	.04½	Hydrate, 500 lb bbls.....lb.	.04½	.05½	.05½	.04½
.08	.07½	.07½	.07½	Nitrate, 700 lb casks.....lb.	.08½	.08½	.08½	.08½
24.00	23.00	23.00	23.00	Barytes, Floated, 350 lb bbls wks....ton	23.00	24.00	24.00	23.00
8.00	5.00	.....	.....	Bauxite, bulk, mines.....ton	5.00	8.00	8.00	5.00
.38	.36	.40	.37	Beeswax, Yellow, crude bags..lb.	...34	.35	.37	.34
.43	.41	.46	.38	Refined, cases.....lb.	.....	.39	.42	.39
.58	.56	.58	.56	White, cases.....lb.	.51	.53	.53	.51
.70	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks.....lb.	.60	.65	.65	.60
				Benzene			
.23	.21	.23	.21	Benzene, 90%, Industrial, 8000 gal tanks wks.....gal.	.....	.23	.23	.23
.23	.21	.23	.21	Ind. Pure, tanks works....gal.	.....	.23	.23	.23
.74	.70	.70	.70	Benzidine Base, dry, 250 lb bbls.....lb.	.70	.74	.74	.70
1.00	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs.lb.	.....	1.00	1.00	1.00
.25	.25	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25	.25
.26	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb.	.24	.26	.26	.24
1.35	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls.....lb.	.....	1.35	1.35	1.35
.65	.63	.63	.63	Tech, 200 lb bbls.....lb.	.60	.65	.68	.60
90.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks..ton	80.00	90.00	90.00	80.00
				Bleaching Powder			
2.25	2.25	2.25	2.00	Bleaching Powder, 300 lb drs c-l wks contract.....100 lb.	.....	2.25	2.25	2.25
2.00	2.00	2.25	2.00	700 lb drs c-l wks contract .....100 lb.	.....	4.00	4.00	4.00
5.25	4.65	3.75	4.75	Blood, Dried, fob, NY.....Unit	.....	4.35	4.60	4.00
5.35	4.75	.....	.....	Chicago.....Unit	.....	5.00	5.00	4.40
5.05	4.50	.....	.....	S. American shipt.....Unit	.....	4.50	4.70	4.25
.35	.31	.30	.28	Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.....	.35	.35	.32
30.00	29.00	38.00	29.00	Bone, raw, Chicago.....ton	.....	42.00	42.00	42.00
.07	.06	.06	.06	Bone, Ash, 100 lb kegs.....lb.	.06	.07	.07	.06
.08½	.08½	.08½	.08½	Black, 200 lb bbls.....lb.	.....	.08½	.08½	.08½
37.00	31.00	30.00	28.00	Meal, 3% & 50%, Imp....ton	.....	31.00	35.00	30.00
.05	..2½	.04½	.04½	Borax, bags.....lb.	.02½	.03½	.03½	.02½
.12	.10½	.11	.11	Bordeaux, Mixture, 16% pwd..lb.	.10½	.12	.12	.10½
.10	.08	.08	.08	Paste, bbls.....lb.	.10	.10½	.10½	.10
28.00	26.00	28.00	26.00	Brazilwood, sticks, shpmt....lb.	26.00	28.00	28.00	26.00
1.20	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20	.60
1.25	.55	.55	.55	Gold bulk.....lb.	.55	1.25	1.25	.55
1.60	1.40	1.60	1.42	Butyl, Acetate, normal drs.... .....lb.	18.9	19.3	19.3	18.4
1.55	1.35	1.55	1.42	Tank, wks.....lb.	.....	18.6	18.6	18.1
.70	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.....	.70	.70	.70
				Carbitol s ee Diethylene Glycol Mono (Butyl Ether).....	.....	.....	.....	.....
				Cellosolv e (see Ethylene glycol mono b utyl ether).....				
				Furoate, tech., 50 gal. dr., lb.	.....	.50	.50	.50
.36	.34	.34	.34	Propionate, drs.....lb.	.34	.36	.36	.34
.60	.60	.60	.60	Stearate, 50 gal drs.....lb.	.....	.60	.60	.60
.60	.57	.57	.57	Tartrate, drs.....lb.	.57	.60	.60	.57
2.00	1.35	1.50	1.35	Cadmium, Sulfide, boxes.....lb.	.95	1.75	1.75	.75
				Calcium			
4.50	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-l.....100 lb.	.....	4.50	4.50	4.50
.09	.06	.07½	.07½	Arsenate, 100 lb bbls c-l wks.....lb.	.07	.09	.09	.07
.06	.05	.05	.05	Carbide, drs.....lb.	.05	.06	.06	.05
1.00	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-l.....lb.	1.00	1.00	1.00	1.00
27.00	25.00	27.00	27.00	Chloride, Flake, 375 lb drs c-l wks.....ton	.....	22.75	25.00	22.75
23.00	20.00	21.00	21.00	Solid, 650 lb drs c-l fob wks .....ton	20.00	20.00	20.00	20.00
52.00	52.00	52.00	52.00	Nitrate, 100 lb bags.....ton	.....	42.00	52.00	42.00
.....	.....	.....	.....	Peroxide, 100 lb. drs.....lb.	.....	1.25	1.25	1.25
.08	.07	.09	.09	Phosphate, tech, 450 lb bbls lb.	.08	.08½	.08	.07
				Stearate, 100 lb bbls.....lb.	.25	.26	.26	.25
				Calurea, bags S. points. c.i.f. ton	.....	83.65	[83.65	82.15
.18	.18	.....	.....	Camwood, Bark, ground bbls..lb.	.....	.18	.18	.18
.28	.22	.33	.33	Candelilla Wax, bags.....lb.	.....	.22	.24	.22
				Carbitol, (See Diethylene Gycol Mono Methyl Ether).....	.....	.....	.....	.....
.15	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-l.....lb.	.08	.15	.15	.08
.12	12	.12	.12	Black, 100-300 lb cases lc-l NY.....lb.	.....	.12	.12	.12
.06	.05½	.05½	.05½	Bisulfide, 500 lb drs lc-l NY.....lb.	.05½	.06	.06	.05½
.06	.06	.06	.06	Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.06	.06
.07½	07	.07	.07	Tetrachloride, 1400 lb drs delivered.....lb.	.06½	.07	.07½	.06½
.58	.45	.50	.50	Carnauba Wax, Flor, bags....lb.	.35	.36	.43	.35
.60	.40	.90	.54	No. 1 Yellow, bags.....lb.	.34	.35	.40	.34
.38	.34	.37	.24	No. 2 N Country, bags.....lb.	.....	.28	.32	.28
.56	.38	.68	.48	No. 2 Regular, bags.....lb.	.31	.32	.36	.31
.32	.25	.....	.....	No. 3 N. C.....lb.	.24	.25	.25	.24
.32	.25½	.....	.....	No. 3 Chalky.....lb.	.24	.25	.26	.24
.18½	.14½	.18½	.15½	Casein, Standard, ground.....lb.	.16	.17	.17	.15

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Organic Chemicals

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

bulk, or 5,471,000 pounds, valued at $1,516,000 consisted of carnauba wax. Of this last amount 5,379,000 pounds originated in Brazil and five other countries are credited with small shipments. Shipments to all countries of carnauba wax from Fortaleza and Pernambuco, amounted to 5,714,000 pounds and 7,196,000 pounds in 1925 and 1926 the latest years for which complete figures are available. Figures for shipments to the United States are available for 1927 and 1928 and show shipments to have amounted to 3,220,000 and 3,418,000 pounds, the bulk of these shipments coming from Fortaleza. Bahia's exports of carnauba wax to the United States, which have always been small as compared with the movement from Ceara, Brazil, dwindled to almost nothing during 1928. The drop in exports to the United States, according to local exporters, was occasioned by the faulty grading of Bahia producers.

Casein — The combination of the advancing season of heavy demand together with the falling off of production as cold weather advances, has brought a much firmer tone into this market during the past month and there is every indication that prices will go higher within a short time. The situation was not eased any by the action of the Senate in raising the proposed duty to 5½c per lb. Casein production in the United States, according to preliminary figures, amounted to 4,696,000 pounds during the first quarter of 1929.

Chlorine — Practically all contracts are in by this time with tonnage reported to be slightly ahead of last year.

Cobalt Oxide — Imports for the first eight months of 1929 amounted to 311,668 pounds, valued at $578,430. This compares with 364,154 pounds, valued at $692,753 in 1928, and 369,747 pounds, valued at $703,608 in 1927. The sources of the cobalt oxide in 1928 were as follows: About 40 per cent each from Canada and Belgium, and 8 per cent each from Germany and Great Britain. In this connection the output of the Belgian factory in 1928 was 450 tons of cobalt in various forms. The ceramics and paint industries have in the past been the major consumers of cobalt but new and greater consuming uses are, at least, a possible development from the recently accelerated use of such research tools as X-rays in the study of metals and alloys and more intensive study of electro chemical processes.

Copper Sulfate — Large European offerings during the past month caused

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cellosolve (see Ethylene glycol mono ethyl ether).....			
				Acetate (see Ethylene glycol mono ethyl ether acetate)..			
.30	.26	.34	.26	Celluloid, Scraps, Ivory cs....lb.	.26	.30	.26
.20	.18	.18	.18	Shell, cases.....lb.	.18	.20	.18
.32	.30	.34	.26	Transparent, cases.....lb.	.30	.32	.32	.30
1.40	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs .lb.	1.20	1.25	1.25	1.20
.03½	.03	.03	.03	Chalk, dropped, 175 lb bbls...lb.	.03	.03½	.03½	.03
.04½	.04½	.02½	.02½	Precip, heavy, 560 lb cks...lb.	.02	.03½	.03½	.02
.03½	.02½	.04½	.04½	Light, 250 lb casks.....lb.	.02½	.03½	.03½	.02½
.19	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks.....bu.	.18	.19	.19	.18
.06½	.06	.06	.06	Willow, powd, 100 lb bbl wks.....lb.	.06	.06½	.06½	.06
.05	.04	.04	.04	Wood, powd, 100 lb bbls...lb.	.04	.05	.05	.04
.03	.02	.03	.02½	Chestnut, clarified bbls wks,..lb.	.02½	.03	.02	.03½
.02	.01½	.02	.01½	25% tks wks.....lb.	.01½	.02½	.02½	.01½
.04 4/5	.04 4/5	.05½	.05½	Powd, 60%, 100 lb bgs wks.lb.	.....	.04 4/5	.04 4/5	.04 4/5
.06	.05½	.06½	.06½	Powd, decolorized bgs wks..lb.	.05½	.06	.06	.05½
9.00	8.00	8.00	8.00	China Clay, lump, blk mines.ton	8.00	9.00	9.00	8.00
.02	.01½	.01½	.01½	Powdered, bbls.....lb.	.01½	.02	.02	.01½
12.00	10.00	10.00	10.00	Pulverized, bbls wks.....ton	10.00	12.00	12.00	10.00
25.00	15.00	15.00	15.00	Imported, lump, bulk.....ton	15.00	25.00	25.00	15.00
.03½	.03	.03	.03	Powdered, bbls.....lb.	.03	.03½	.03½	.03
				Chlorine			
.09	.08	.08	.08	Chlorine, cyls 1c-1 wks contract .....lb.	.07½	.08½	.08½	.07½
.....	.....	.....	.....	cyls, cl wks,. contract ..lb.	.....	.04½	.04½	.04½
.03½	.03½	.05½	.04	Liq tank or multi-car lot cyls wks contract.....lb.	.0275	.0285	.03	.0275
.07	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs 1c-1 wks.....lb.	.08½	.09½	.09½	.08½
.22	.20	.20	.20	Chloroform, tech, 1000 lb drs..lb.	.....	.16	.20	.16
1.35	1.00	1.00	1.00	Chloropicrin, comml cyls.....lb.	1.00	1.35	1.35	1.00
.29	.26	.27	.26	Chrome, Green, CP.....lb.	.26	.29	.29	.26
.11	.06½	.06½	.06½	Commercial.....lb.	.06½	.11	.11	.06½
.17	.15½	.17½	.16½	Yellow.....lb.	.17	.18	.18	.15
.05½	.04½	.05	.04½	Chromium, Acetate, 8% Chrome bbls.....lb.	.04½	.05½	.05½	.04½
.05½	.05½	.05½	.05½	20° soln, 400 lb bbls.....lb.	.....	.05½	.05½	.05½
.28	.27	.27	.27	Fluoride, powd, 400 lb bbl..lb.	.27	.28	.28	.27
.35½	.34½	.34½	.34½	Oxide, green, bbls.....lb.	.34½	.35½	.35½	.34½
9.50	9.00	9.50	9.00	Coal tar, bbls.....bbl	10.00	10.50	10.50	10.00
2.22	2.10	2.10	2.10	Cobalt Oxide, black, bags....lb.	2.10	2.22	2.22	2.10
.87	.84	.92	.77	Cochineal, gray or black bag..lb.	.....	.95	.95	.95
.86	.86	.92	.77	Teneriffe silver, bags.....lb.	.....	.95	.95	.95
				Copper			
17.00	12.90	13.57½	12.90	Copper, metal, electrol...100 lb.	.....	17.78	24.00	17.00
.17½	.16	.16½	.06½	Carbonate, 400 lb bbls.....lb.	.13	.21½	.25	.13
.28	.28	.28	.28	Chloride, 250 lb bbls.....lb.	.25	.28	.28	.25
.50	.48	.48	.48	Cyanide, 100 lb drs.....lb.	.50	.55	.60	.48
.17	.16½	.16½	.16½	Oxide, red, 100 lb bbls.....lb.	.24	.32	.32	.16½
.19	.18	.18	.17	Sub-acetate verdigris, 400 lb bbls.....lb.	.18	.19	.19	.18
5.50	5.05	5.00	4.75	Sulfate, bbls c-1 wks...100 lb.	.....	5.50	7.00	5.50
14.00	13.00	17.00	13.00	Copperas, crys and sugar bulk c-1 wks.....ton	13.00	14.00	14.00	13.00
1.35	1.25	1.25	1.25	Sugar, 100 lb bbls.....100 lb.	1.25	1.35	1.35	1.25
.42	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls.....lb.	.40	.42	.42	.40
.....	.....	42.00	20.00	Cottonseed, S. E. bulk c-1...ton	.....	.....	.....	.....
.....	.....	42.00	20.00	Meal S. E. bulk.....ton	.....	.....	.....	.....
38.00	36.00	35.00	21.50	7% Amm., bags mills...ton	37.50	38.00	38.00	37.50
.27½	.26	.27	.22	Cream Tartar, USP, 300 lb. bbls.....lb.	.....	.26½	.28	.26½
.42	.40	.40	.40	Creosote, USP, 42 lb cbys....lb.	.40	.42	.42	.40
.19	.17	.20	.20	Oil, Natural, 50 gal drs....gal.	.17	.19	.19	.17
.23	.21	.25	.25	10-15% tar acid.....gal.	.21	.23	.23	.21
.28	.25	.....	.....	25-30% tar acid.....gal.	.25	.28	.28	.25
.20	.17½	.17½	.17½	Cresol, USP, drums.....lb.	.14	.17	.17	.14
				Crotonaldehyde, 50 gal dr....lb.	.32	.36		
.17	.16	.17	.16	Cudbear, English.....lb.	.16	.17	.17	.16
.18½	.18½	.18½	.15	Cutch, Rangoon, 100 lb bales..lb.	.14	.16	.16	.14
.07	.06	.05	.05½	Borneo, Solid, 100 lb bale..lb.	.08	08½	.08½	.08
1.75	1.67½	1.82½	1.67½	Cyanamide, bulk c-1 wks Nitrogen unit.....	.....	2.00	2.00	2.00
5.12	3.77	3.92	3.77	Dextrin, corn, 140 lb bags.100 lb.	4.72	4.92	4.92	4.62
5.07	3.72	3.87	3.72	White, 130 lb bags.....100 lb.	4.67	4.87	4.87	4.57
.09	.08	.08½	.08½	Potato, Yellow, 220 lb bgs..lb.	.08	.09	.09	.08
.09	.08	.08½	.08½	White, 220 lb bags 1c-1....lb.	.08	.09	.09	.08
.08½	.08	.08½	.08	Tapioca, 200 lb bags 1c-1...lb.	.08	.08½	.08½	.08
.....	.....	3.80	3.80	Diaminophenol, 100 lb kegs...lb.	.....	3.80	3.80	3.80
3.80	3.80	2.95	2.85	Diamylphthalate, drs wks...gal.	.....	3.80	3.80	3.80
2.90	2.85	3.25	3.25	Dianisidine, 100 lb kegs.....lb.	3.00	3.10	3.10	3.00
.28	.26½	.31½	.29½	Dibutylphthalate, wks.....lb.	.....	.26½	.26½	.26½
.31½	.29½	.55	.55	Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.31½	.29½
.....	.....	.....	.....	Dichloroethylether, 50 gal drs lb.	.05	.07	.13	.05
.65	.55	.23	.23	Dichloromethane, drs wks....lb.	.55	.65	.65	.55
.25	.23	2.15	2.15	Diethylamine, 400 lb drs.....lb.	2.75	3.00	3.00	2.75
2.15	2.15	1 85	1.85	Diethylcarbonate, drs ..... gal.	1.85	1.90	1.90	1.85
2.00	1.85	.55	.55	Diethylaniline, 850 lb drs....lb.	.55	.60	.60	.55
.60	.55.	20	.20	Diethyleneglycol, drs.....lb.	.10	.12	.13	.10
.15	.10	.....	.....	Mono ethyl ether, drs....lb.	.13	.15	.15	.13
.35	.25	.....	.....	Mono butyl ether, drs....lb.	.28	.30	.30	.25
.....	.....	.....	.....	Mono methyl ether, 50 gal. dr.....lb.	.15	.18	.22	.15
.....	.....	.....	.....	Diethylene oxide, 50 gal dr....lb.	.....	.50	.50	.50
.67	.64	.64	.64	Diethylorthotoluidin, drs.....lb.	.64	.67	.67	.64
.26	.24	.25	.25	Diethyl phthalate, 1000 lb drums.....lb.	.24	.26	.26	.24
.35	.30	.30	.30	Diethylsulfate, technical, 50 gal drums.....lb.	.30	.35	.35	.30
2 62	2.62	2.60	2.60	Dimethylamine, 400 lb drs...lb.	.....	2.62	2.62	2.62
.32	.30	.32	.30	Dimethylaniline, 340 lb drs...lb.	.30	.32	.32	.30

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

domestic producers to lower the price to $5.50 per 100 lbs. to meet the purely local and temporary condition which resulted. Large stocks had accumulated in Europe and were being offered in the domestic market regardless of cost. However, it is pointed out that the present price cannot remain, unless there is a drop in the metal price, since the material cannot be made and sold at that price, with the present price of the raw material. As a drop in the copper price does not seem likely, sulfate prices will probably go higher in the near future. Although domestic demand is very quiet, shipments for export are proceeding in very satisfactory volume. Exports for this past month have been well ahead of those of last year. Exports from the first seven months of 1929 amounted to 2,075 tons, valued at $238,000. This compares with exports for the entire year of 1928 of 4,333 tons, valued at $455,000, and with 3,103 tons, valued at $321,000 in 1927. Imports for the first seven months amounted to 632 tons, valued at $68,000, which compares with 1,805 tons valued at $172,000 in 1928 and 989 tons, valued at $89,000 in 1927. American production reached the record figure of 25,483 tons in 1927, valued at $2,491,000.

Ethyl Acetate — Demand for this material is reported off somewhat due to curtailed activities of automobile producers.

Fish Scrap — The low prices quoted last month stimulated business to such an extent that stocks were soon almost sold out and together with the end of the season, brought higher prices. As a result, prices are now 50c per unit higher than when last quoted, and stocks are practically cleaned up.

Formaldehyde — Competition in this material continues very keen with raw material costs low, but quoted prices have not been reduced any further. There seems to be little doubt however, that considerable price shading is present on large business.

Glycerine — The market continues rather inactive with price shading in some quarters on volume business.

Exports of glycerine during August 1929, amounted to 46,497 lbs. against 138,517 lbs. in August 1928. Imports for that month were 1,140,986 lbs. of crude and 119,734 lbs. of refined glycerine, totalling 1,260,720 lbs., as compared with 164,766 lbs. for the same months last year.

Gums — As indicated here last month, a large portion of the mastic crop was destroyed by heavy rains. The full ex-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.50	.45	.45	.45	Dimethylsulfate, 100 lb drs...lb.	.45	.50	.50	.45
.16½	.15½	.15½	.15	Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.16½	.15½
.16	.15	.15	.15	Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.15	.13
.34	.32	.32	.32	Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.37	.34
.32	.31	.31	.31	Dinitrophenol, 350 lb bbls....lb.	.31	.32	.32	.31
.19	.18	.18	.15	Dinitrotoluene, 300 lb bbls...lb.	18	.19	.19	.18
.90	.48	1.05	.85	Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.49	.42
.....	.....	.....	.....	Dioxan (See Diethylene Oxide)	.....	.....	.....	.....
				Diphenyl.....lb.	.40	.50	.50	.40
.47	.45	.48	.45	Diphenylamine.....lb.	.....	.40	.47	.40
.72	.40	.....	.....	Diphenylguanidine, 100 lb bbl lb.	.30	.35	.40	.30
.30	.26	.26	.26	Dip Oil, 25%, drums.....lb.	.26	.30	.30	.26
62.00	58.00	49.00	41.00	Divi Divi pods, bgs shipmt..ton	.....	46.50	57.00	46.50
.05½	.05	.04	.04	Extract.....lb.	.05	.05½	.05½	.05
.82	.73	.84	.72	Egg Yolk, 200 lb cases.....lb.	.77	.79	.84	.77
				Epsom Salt, tech, 300 lb bbls c-1 NY.....100 lb.	1.70	1.90	1.90	1.70
1.75	1.7	2.00	1.75	Ether, USP, 1880, 50 lb drs..lb.	.38	.39	.39	.38
.38	.37	.45	.37	Ethyl Acetate, 85% Ester, ...				
1.05	.75	.90	.90	tanks.....lb.	.....	12.2	12.2	12.2
1.25	1.10	1.10	1.03	drums.....lb.	12.5	12.9	12.9	12.5
.....	.....	.....	.....	Acetoacetate, 50 gal drs....lb.	.65	.68	.68	.65
1.11	1.05	1.05	1.05	Benzylaniline, 300 lb drs...lb.	1.05	1.11	1.11	1.05
.70	.70	.50	.50	Bromide, tech, drums .....lb.	.50	.55	.55	.50
.....	.....	.....	.....	Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.90	1.85
.22	.22	.22	.22	Chloride, 200 lb. drums....lb.	.....	.22	.22	.22
.....	.....	.....	.....	Chlorocarbonate, 50 gal dr.gal.	.35	.40	.40	.35
.....	.....	.....	.....	Ether, Absolute, 50 gal drs..lb.	.50	.52	.52	.50
				Furoate, 1 lb tins .....lb.	.....	5.00	5.00	5.00
3.50	3.50	3.50	3.50	Lactate, drums works.....lb.	.25	.29	.35	.25
.30	.30	.30	.30	Methyl Ketone, 50 gal drs..lb.	.....	.30	.30	.30
.55	.45	.45	.45	Oxalate, drums works.....lb.	.45	.55	.55	.45
.36	.30	.....	.....	Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.36	.30
.70	.70	.70	.70	Ethylene Bromide, 60 lb dr...lb.	.....	.70	.70	.79
				Chlorhydrin, 40%, 50 gal drs chloro. cont.....lb.	.75	.85	.85	.75
.85	.75	.75	.75	Dichloride, 50 gal drums...lb.	.05	.07	.10	.05
.11	.07	.15	.11	Glycol, 50 gal drs wks.....lb.	.25	.28	.30	.25
.40	.25	.30	.30	Mono Butyl Ether drs wks.	.23	.27	.31	.23
.27	.31	.....	.....	Mono Ethyl Ether drs wks	.16	.20	.24	.16
.20	.24	.....	.....	Mono Ethyl Ether Acetate dr. wks.....	.19	.23	.26	.19
.23	.26	.....	.....	Mono Methyl Ether, drs.lb.	.19	.23	.23	.19
				Oxide, cyl.....lb.	.....	2.00		
.65	.62	.62	.62	Ethylidenaniline.....lb.	.62	.65	.65	.62
25.00	20.00	20.00	20.00	Feldspar, bulk.....ton	25.00	20.00	25.00	20.00
21.00	15.00	15.00	15.00	Powdered, bulk works.....ton	15.00	.21	21.00	15.00
.09	.07½	.07½	.07½	Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.07½	.09	.09	.07
5.50&10	4.90&10	5.60	4.15	Fish Scrap, dried, wks.....unit	.....	4.15&10	4.15&10	3.65&10
				Acid, Bulk 7 & 3½% delivered				
4.75&50	4.00&50	3.50	4.24	Norfolk & Balt. basis...unit	.....	3.50&50	4.00&50	3.50&50
1.15	1.10	1.10	.90	Flavine, lemon, 55 lb cases...lb.	1.10	1.15	1.15	1.10
1.15	1.10	1.10	.85	Orange, 70 lb cases.....lb.	1.10	1.15	1.15	1.10
				Flaxseed.....lb.	.....	.....		
.....	.....	.....	.....	Ex-dock.....ton	.....	25.00	25.00	25.00
25.00	25.00	25.00	25.00	Fluorspar, 98%, bags.....	41.00	46.00	46.00	41.00

Formaldehyde

.....	.....	.....	.....	Formaldehyde, aniline, 100 lb. drums.....lb.	.....	.....	.....	.....
.42	.39	.39	.39	USP, 400 lb bbls wks.....lb.	.39	.42	.42	.39
.09	.08½	.11½	.08½	Fossil Flour.....lb.	.08½	.09	.10	.08½
.04	.02½	.02½	.02½	Fullers Earth, bulk, mines..ton	.02½	.04	.04	.02½
20.00	15.00	15.00	15.00	Imp. powd c-1 bags.....ton	15.00	20.00	20.00	15.00
30.00	25.00	25.00	25.00	Furfural 500 lb drums.....lb.	25.00	30.00	30.00	25.00
.19½	.17½	.17½	.17½	Furfuramide (tech) 100 lb dr..lb.	.17½	.19½	.19½	.17½
.....	.....	.....	.....	Furfuryl Acetate, 1 lb tins....lb.	.....	.30	.30	.30
.....	.....	.....	.....	Alcohol, (tech) 100 lb dr....lb.	.....	5.00	5.00	5.00
.....	.....	.....	.....	Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.50	.50
1.35	1.3	1.69	1.35	Fusel Oil, 10% impurities ...gal.	.....	.50	1.00	.50
.05	.04	.04	.04	Fustic, chips.....lb.	.04	1.35	1.35	1.35
.22	.20	.20	.20	Crystals, 100 lb boxes.....lb.	.20	.05	.05	.04
.10	.09	.09	.09	Liquid, 50°, 600 lb bbls....lb.	.09	.22	.22	.20
.23	.20	.20	.20	Solid, 50 lb boxes.....lb.	.14	.10	.10	.09
32.00	30.00	30.00	30.00	Sticks.....ton	25.00	.16	.16	.14
.52	.50	.50	.50	G Salt paste, 360 lb bbls.....lb.	.45	26.00	26.00	25.00
.21	.20	.20	.20	Gall Extract.....lb.	.20	.50	.52	.45
.09	.08	.08	.06	Gambier, common 200 lb cs...lb.	.06	.21	.21	.20
.14	.12	.12	.12	25% liquid, 450 lb bbls....lb.	.12	.07	.07	.06
.12	.11	.23	.11	Singapore cubes, 150 lb bg..lb.	.08½	.14	.14	.12
.50	.45	.45	.30	Gelatin, tech, 100 lb cases....lb.	.45	.09	.09	.08½
1.00	.70	1.05	1.05	Glauber s Salt, tech, c-1 wks.....100 lb.	1.00	.50	.50	.45
3.34	3.24	3.24	3.24	Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	1.70	1.70	.70
3.14	3.14	3.14	3.14	Tanner's Special, 100 lb bags .....100 lb.	.....	3.34	3.34	3.20
.24	.20	.20	.20	Glue, medium white, bbls ...lb.	.20	3.14	3.14	3.14
.26	.22	.22	.22	Pure white, bbls.....lb.	.22	.24	.24	.20
.19	.15	.29	.22	Glycerin, CP, 550 lb drs.....lb.	.14	.26	.26	.22
.15	.11½	.25	.17	Dynamite, 100 lb drs.....lb.	.11½	.14½	.16	.13½
.10½	.08½	.....	.....	Saponification, tanks.....lb.	.07½	.12	.12½	.10½
.09½	.07½	.....	.....	Soap Lye, tanks.....lb.	.06½	.08	.08½	.07½
35.00	15.00	15.00	15.00	Graphite, crude, 220 lb bgs...ton	15.00	.07	.07½	.06½
.09	.06	.05	.05	Flake, 500 lb bbls.....lb.	.06	35.00	35.00	15.00
						.09	.09	.06

Gums

.04½	.03½	.03½	.03½	Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03½	.04½	.04½	.03
.06½	.06	.06	.06	Powd, 150 lb bags.....lb.	.06	.06½	.06½	.06½

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

tent of the damage is now known and amounts to about 40 per cent. The price has advanced so that quotations are now at 63c @ 65c lb., and there is every indication of a 70c @ 75c market within the near future. The extent of the damage to the elemi crop is still unknown and prices have not as yet been affected. Sandarac is again starting on an upward journey. Definite control of the market has been obtained, spot stocks are practically unknown and prices have already gone to 36½c @ 38c lb., with every indication of 40c @ 50c lb. being reached before the first of the year. Import statistics compiled for the first eight months of this year reveal that receipts of gum damar advanced 24 per cent in quantity or from 9,932,480 pounds, having a value of $1,264,851 in 1928 to 13,091,109 pounds, valued at $1,676,415 during1929. Estimates of total arrivals of copal gum at Antwerp were 2,271 tons for August in comparison with 1,205 tons received in July and 305 tons in June. Declared exports from Antwerp to the United States during August amounted to 584,774 pounds, reaching 4,800,635 pounds for the first eight months of this year.

Mercury — Continues in routine demand with prices somewhat reduced from those which prevailed a month ago. Quotations are now at $124.00 @ $125.00 per flask. A report in the "Chemist & Druggist", London, indicates that "a succession of gradually higher prices until a certain level is reached seems probable as the dwindling secondhand stocks become absorbed and the grip of the monopoly becomes felt". The old merchant trade in London has apparently been taken by surprise by the selling methods adopted by Mercurio Europeo, and their operations are bound to be considerably handicapped, although it may be premature to assume that the merchant trade is to be extinguished altogether as there is a certain amount of competition to be reckoned with from outside sources, which, in fact, may well be expected to eventually assume more important dimensions as time goes on, as the high price will tend to stimulate production in various countries. Meanwhile the market is largely ruled by the policy pursued by the Combine, whose accredited agents are adopting more business-like methods with the consuming element. Net prices are being quoted in that direction, whether f. o. b. port of shipment, or c. i. f. to arrive, or delivered ex wharf, whereas on the terms usually quoted by outside importers or brokers for limited quantities or small lots delivered from warehouse, the customary discount is allowed, which is equal to approxi-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.20	.18	.18	.18	Yellow, 150-200 lb bags....lb.	18	.20	.20	.18
				Animi (Zanzibar) bean & pea				
.40	.35	.40	.35	250 lb cases.....lb.	.35	.40	.40	.35
.55	.50	.60	.50	Glassy, 250 lb cases.....lb.	.50	.55	.55	.50
				Asphaltum, Barbadoes (Manjak)				
.12	.09	.09	.09	200 lb bags.....lb.	.09	.12	.12	.09
.17	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
				Gilsonite Selects, 200 lb bags				
65.00	55.00	55.00	55.00	.....ton	58.00	65.00	65.00	58.00
				Damar Batavia standard 136, lb				
.26	.22½	.26½	.26½	cases.....lb.	.22	.22½	.26	.22
.11	.10½	.10½	.07	Batavia Dust, 160 lb bags.....lb.	.10½	.11	.11	.10½
.17½	.16	.18½	.17½	E Seeds, 136 lb cases.....lb.	.15	.15½	.17½	.15
				F Splinters, 136 lb cases and				
.14½	.13	.14	.09	bags.....lb.	.13	.13½	.13½	.13
.30½	.29½	.34	.33½	Singapore, No 1, 224 lb cases lb.	.26	.28	.30½	.26
.24	.20	.22½	.21	No. 2, 224 lb cases.....lb.	.....	.21½	.24	.21½
.15	.13½	.14	.11	No. 3, 180 lb bags.....lb.	.10	.11½	.14	.10
				Benzoin Sumatra, U. S. P. 120 lb				
.48	.33	.35	.30	cases.....lb.	.38	.40	.40	.38
				Copal Congo, 112 lb bags, clean				
.15	.14	.14	.12	opaque.....lb.	.16	.17	.17	.14
.09	.08½	.08½	.08½	Dark, amber.....lb.	.08½	.09	.09	.08½
.14	.12½	.12½	.12½	Light, amber.....lb.	.12½	.14	.14	.12½
.36	.35	.35	.35	Water white.....lb.	.35	.36	.36	.35
.65	.58	.....	.....	Mastic.....lb.	.63	.65	.65	.58
				Manila, 180-190 lb baskets				
.17½	.16	.16	.16	Loba A.....lb.	.17	.17½	.17½	.17
.16½	.15	.15	.15	Loba B.....lb.	.15½	.16	.16½	.15½
.14	.13	.14½	.13	Loba C.....lb.	.13½	.14	.14½	.13½
.19	.16	.16	.16	Pale bold, 224 lb cs.....lb.	.17	.19	.19	.17
.13½	.12	.14	.12	Pale nubs.....lb.	.13	.13½	.13½	.13
.11	.07½	.07½	.07½	East Indies chips, 180 lb bags lb.	.10	.11	.11	.10
.21	.17	.....	.....	Pale bold, 180 lb bags....lb.	.20	.21	.21	.20
.16	.14	.17	.17	Pale nubs.....lb.	.15	.16	.16	.15
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.	.....	.....		
.25½	.22	.29	.25	Pale bold gen No 1.....lb.	.20	.21	.23	.20
.15	.13	.19	.13	Pale gen chips spot.....lb.	.14½	.15	.15	.14½
.14	.13	.14	.13	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13½
.13½	.13	.13	.12	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.13	.12	.13	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
				Kauri, 224-226 lb cases No. 1				
.57	.50	.67½	.57	.....lb.	.50	.57	.57	.50
.38	.35	.44½	.38	No. 2 fair pale.....lb.	.35	38	.38	.35
				Brown Chips, 224-226 lb				
.12	.10	.14½	.10	cases.....lb.	.10	.12	.12	.10
.....	.....	.42	.38	Bush Chips, 224-226 lb	.....	.....		
.40	.38	.....	.....	cases.....lb.	.38	.40	.40	.38
.....	.....	.....	.....	Pale Chips, 224-226 lb cases				
.26	.24½	.31½	.24½	.....lb.	.24½	.26	.26	.24½
.60	.26	.27	.25	Sandarac, prime quality, 200				
				lb bags & 300 lb casks...lb	.36½	.38	.72	.35
.....	.....	.....	.....	Helium, 1 lit. bot. .....lit	.....	25.00	.20	.17
.20	.17	.12	.12	Hematine crystals, 400 lb bbls lb.	.17	.20	.11	.17
.11	.11	.09	.09	Paste, 500 bbls.....lb.	.....	.11	.11	.11
.03½	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03½	.03½	.03½	.03½
16.00	16.00	16.00	16.00	Bark.....ton	.....	16.00	17.00	16.00
.60	.60	.60	.45	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.56	.62	.80	.62	Hexamethylenetetramine, drs .lb.	.48	.50	.58	.48
4.00	4.00	3.35	2.75	Hoof Meal, fob Chicago....unit	.....	3.75	4.00	3.75
.....	.....	3.90	3.0	South Amer. to arrive....unit	.....	3.75	3.90	3.75
				Hydrogen Peroxide, 100 vol, 140				
.26	.24	.30	.22	lb cbys.....lb.	.24	.26	.26	.24
.15	.12	.12	.12	Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
1.30	1.28	1.28	1.20	Indigo Madras, bbls.....lb.	1.28	1.30	1.30	1.28
.18	.15	.15	.18	20% paste, drums.....lb.	.15	.18	.18	.15
.08	.07½	.07½	.07½	Solid, powder.....lb.	.07½	.08	.08	.07½
				Iron Chloride, see Ferric or				
				Ferrous				
.10	.09	.09	.09	Iron Nitrate, kegs.....lb.	.09	.10	.10	.09
3.25	2.50	2.50	2.50	Coml, bbls.....100 lb.	2.50	3.25	3.25	2.50
.12	.10	.10	.10	Oxide, English.....lb.	.10	.12	.12	.10
.03½	.02½	.02½	.02½	Red, Spanish.....lb.	.02½	.03½	.03½	.02½
.90	.85	.85	.85	Isopropyl Acetate, 50 gal drs gal.	.85	.90	.90	.85
.20	.17	.29	.17	Japan Wax, 224 lb cases.....lb.	.....	.16½	.18	.16½
70.00	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	.....	14.00	13.00	Lead Acetate, bbls wks...100 lb.	13.00	13.50	13.50	13.00
				White crystals, 500 lb bbls				
13.50	13.00	14.00	13.00	wks.....100 lb.	14.00	14.50	14.50	14.00
.15	.13	.15½	.13½	Arsenate, drs 1c-1 wks.....lb.	.13	.15	.15	.13
				Dithiofuroate, 100 lb dr....lb.	.....	1.00		
6.25	6.25	7.80	6.20	Metal, c-1 NY.....100 lb.	.....	7.75	7.75	6.10
.14	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.18	.17½	.17½	.17½	Oleate, bbls.....lb.	.17½	.18	.18	.17½
.08½	.08½	.10½	.08½	Oxide Litharge, 500 lb bbls.lb.	.....	.08½	.08½	.08½
.09½	.09½	.11½	.09½	Red, 500 lb bbls wks....lb.	.....	.09½	.09½	.09½
.09	.09	.09½	.09	White, 500 lb bbls wks...lb.	.....	.09½	.09½	.09
.08½	.08½	.09	.08½	Sulfate, 500 lb bbls wk...lb.	.....	.08½	.08½	.08½
				Leuna saltpetre, bags c.i.f...ton	.....	53.50	53.50	52.00
				S. points c. i. f.....ton	.....	53.80	53.80	52.30
4.50	4.50	4.50	4.50	Lime, ground stone bags.....ton	.....	4.50	4.50	4.50
1.05	1.05	1.05	1.05	Live, 325 lb bbls wks...100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
.17	.15	.15	.15	Lime-Sulfur soln bbls.....gal.	.15	.17	.17	.15
				Lithopone, 400 lb bbls 1c-1 wks				
.06½	.06½	.06½	.06½	.....lb.	.....	.05½	.06½	.05½
.08½	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08½	.08½	.08½	.08½
.03½	.03	.03	.03	Chips, 150 lb bags.....lb.	.03	.03½	.03½	.03
.12½	.12½	.12	.12	Solid, 50 lb boxes.....lb.	.....	.12½	.12½	.12½
27.00	26.00	26.00	26.00	Sticks.....ton	24.00	26.00	26.00	24.00
.08	.07½	.07½	.07½	Lower grades.....lb.	.07½	.08	.08	.07½
.30	.30	.30	.30	Madder, Dutch.....lb.	.22	.25	.25	.22
50.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl...ton	50.00	60.00	60.00	50.00
				Magnesium				
				Magnesium Carb, tech, 70 lb				
.06½	.06	.06½	.06	bags NY.....lb.	.06	.06½	.06½	.06

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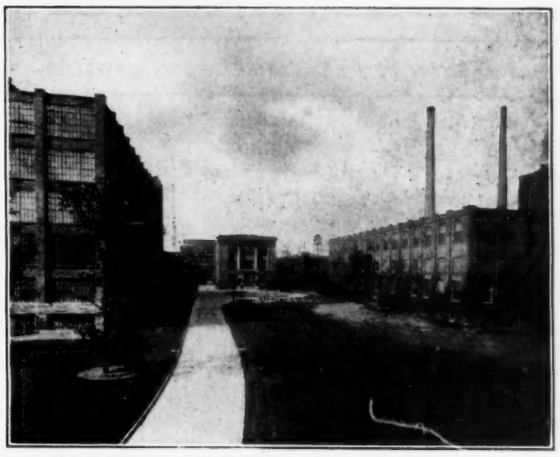

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Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

mately 12s. 6d. per bottle at the current quotation of, say, £22 10s. per bottle. There has been a distinctly harder tendency in the market lately, which is due to the fact that available supplies are still restricted, although much better arrivals were recorded for last month, amounting to 1,778 bottles, against only 659 bottles for August. Last month's return is the best seen so far this year, but compares with abnormally heavy receipts for the same month last year of as much as 7,941 bottles, while the total for the nine months to the end of September this year only represents 3,814 bottles, which only just exceeded re-exports over that period, and indicates a deficit of well over 18,000 bottles and 12,000 bottles respectively against the corresponding period in the two preceding years.

Phenol — Shipments have been moving more freely during the past month, but as yet there is but little easing of the position on spot goods. There is considerable talk of increased production, but thus far nothing has progressed beyond the rumor stage.

Potash Caustic — Imports of caustic potash for the first eight months of the current year totaled nearly 5,200 tons, valued at $714,397, an increase of 36 per cent in tonnage and 60 per cent in value over the imports for the corresponding period of 1928. In that year, however, imports of caustic potash reached the lowest tonnage since 1923. Following is the record of the import trade of this chemical since 1920: 1920, 856 tons, $451,274; 1921, 5,455 tons $487,182; 1922, 5924 tons, $715,910; 1923 5,419 tons $658 309; 1924, 6,314 tons, $698,635; 1925, 6,138 tons, $734,967; 1926, 6,483 tons, $770,468; 1927, 7 379 tons, $915,811; 1928, 5,824 tons, $686,479; 1929 (8 mos.), 5,824 tons, $686,479.

Salt Cake — The increasing scarcity of this material has finally resulted in quotations of higher prices by producers.

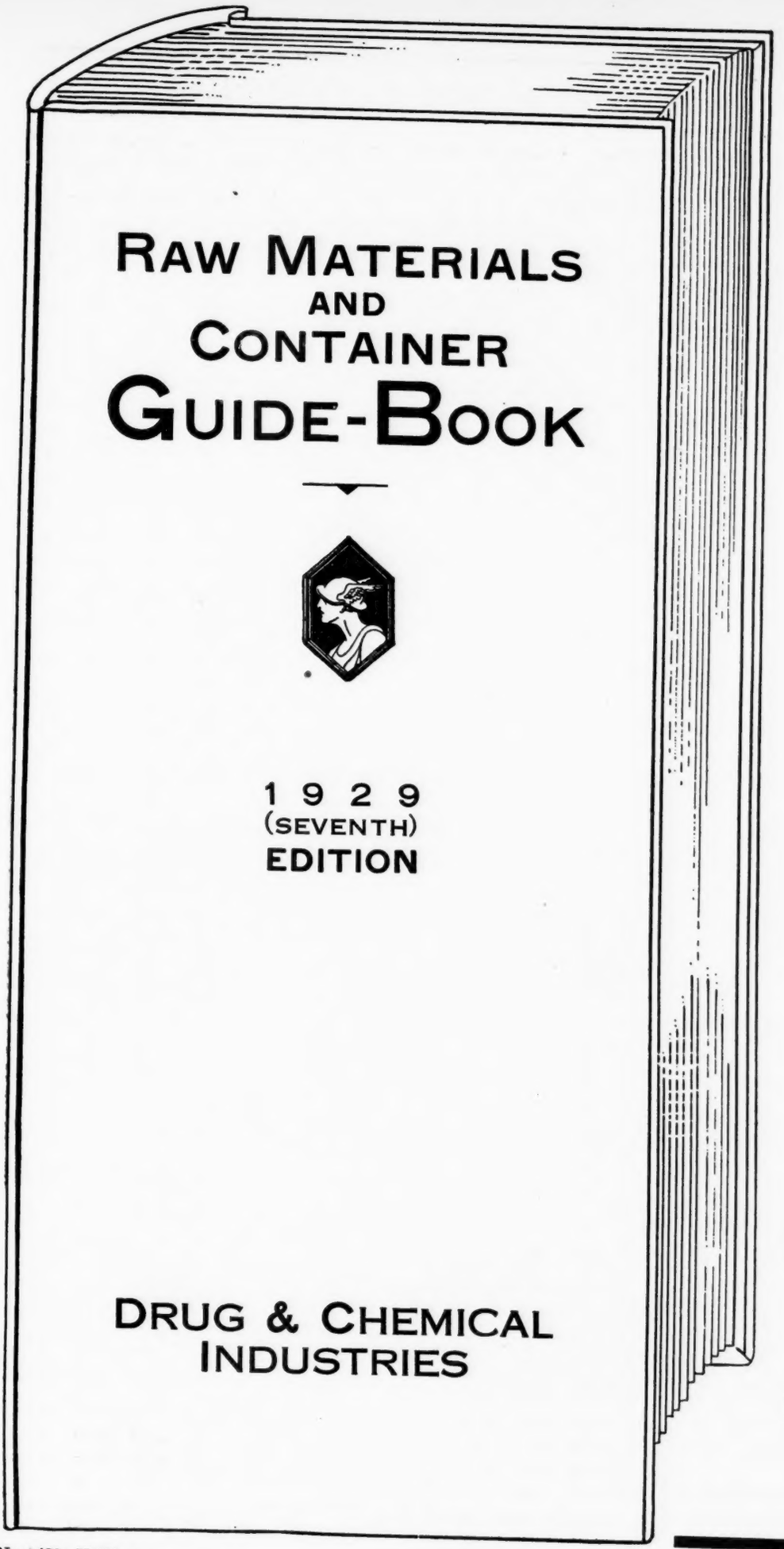
Shellac — Has declined steadily during the past month. Easy conditions have prevailed due to dullness both here and abroad due to lack of any buying interest whatever. Imports during the first eight months of this year were 34 per cent higher than for the corresponding period of 1928. Comparative figures were respectively 15,958,331 pounds, valued at $6,678,336 and 24,275,839 pounds, valued at $9,251,221.

Soda Ash — Somewhat slackened inquiry has been noted from plate glass manufacturers, chiefly due to curtailment of building activities. However, no let up

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Chloride flake, 375 lb. drs c-l wks.....ton	.....	36.00	36.00	36.00
37.00	27.00	37.00	37.00	Important shipment.....ton	.....	33.00	33.00	33.00
33.00	33.00	33.00	33.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
31.00	31.00	31.00	31.00	Fluosilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10½	.10
.10½	.10	.10	.10	Oxide, USP, light, 100 lb bbls				
				.....lb.	.....	.42	.42	.42
.42	.42	.42	.42	Heavy, 250 lb bbls.....lb.	.....	.50	.50	.50
.50	.50	.50	.50	Peroxide, 100 lb cs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Silicofluoride, bbls.....lb.	.09½	.10½	.10½	.09½
.10½	.09½	.12½	.09½	Stearate, bbls.....lb.	.25	.26	.26	.25
.25	.23	.23	.23	Manganese Borate, 30%, 200 lb				
				bbls.....lb.	.....	.19	.24	.19
.24	.24	.24	.24	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.08½	.08	.08	.08	Dioxide, tech (peroxide) drs lb.	.04½	.06	.06	.04½
.....	.....	.05	.04½	Ore, powdered or granular				
.50	.35	.....	.....	75-80%, bbls.....lb.	.03	.03½	.03½	.03
.03½	.03	.03	.03	80-85%, bbls.....lb.	.04	.04½	.04½	.04
.04½	.04	.04	.04	85-88%, bbls.....lb.	.05	.05½	.05½	.05
.05½	.05	.05	.05	Sulfate, 550 lb drs NY.....lb.	.08	.08½	.08½	.08
.07½	.07	.07	.07	Mangrove 55%, 400 lb bbls..lb.	.03½	Nom.	Nom.	.03½
Nom.	.03½	.03½	.03½	Bark, African.....ton	.....	32.00	35.00	30.00
45.00	39.000	034.00	0 1 3.	Marble Flour, bulk.....ton	14.00	1 .00	15 00	14.00
12.00	10.00	10.00	5 .	Mercurous chloride .....lb.	.....	2 05	2 05	2.05
132.00	121.00	129 99.00	.00	Mercury metal.....75 lb flask	124.00	125.00	126.00	120.00
.74	.72	.72	.72	Meta-nitro-aniline.....lb.	.67	69	.74	.67
				Meta-nitro-para-toluidine 200 lb.				
1.80	1.50	1.70	1.70	bbls.....lb.	1.50	1.55	1.55	1.50
				Meta-phenylene-diamine 300 lb.				
.94	.90	.90	.90	bbls.....lb.	.84	.90	.90	.84
				Meta-toluene-diamine, 300 lb				
.74	.72	.72	.72	bbls.....lb.	.67	.69	.72	.67

Methanol

				Methanol, (Wood Alcohol),....				
.58	.46	.80	.55	95%.....gal.	.55	.60	.65	.55
.60	.47	.87	.57	97% .....gal.	.57	.62	.65	.57
.63	.44	.....	.....	Pure, ... gal.	.60	.65	.68	.60
.58	.48	.....	.....	Synthetic, drums c-1.....gal.	.57	.62	.66	.57
.75	.45	.80	.75	Denat. gre. tanks.....gal.	.60	.62	.62	.60
.95	.95	.95	.95	Methyl Acetate, drums.....gal.	.....	.98	.95	.95
.90	.68	.88	.75	Acetone, 100 gal drums...gal.	.83	.85	.85	.83
.95	.85	1.00	.85	Anthraquinone, kegs.....lb.	.85	.98	.95	.85
				Cellosolve, (See Ethylene				
.....	.....	.....	.....	Glycol Mono Methyl Ether)	.....	.....	.60	.55
60	.55	.55	.55	Chloride, 90 lb cyl.....lb.	.55	.60	.....	.....
				Furoate, tech., 50 gal. dr., lb.	.....	50	.50	.50
80.00	65.00	.03½	.03½	Mica, dry grd. bags wks.....lb.	65 00	80.00	80.00	65.00
115.00	110.00	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115 00	115.00	110.00
.....	.....	3.00	3.00	Michler's Ketone, kegs.....lb.	.....	3.00	3.00	3.00
				Monochlorobenzene, drums see,				
.75	.70	.70	.70	Chorobenzene, mono.....lb.				
				Monoethylorthotoluidin, drs. lb.	.70	.75	.75	.70
4.20	3.95	3.95	3.95	Monomethylparaminosufate 100				
.07	.06½	.06½	.06½	lb drums.....lb.	3.95	4 20	4.20	3.95
.04½	.04½	.04	.04	Montan Wax, crude, bags....lb.	.06½	.07	.07	.06½
.08½	.08	.08	.08	Myrobalans 25%, liq bbls....b	.04½	.04½	.04½	.04½
50.00	42.00	43.50	41.00	50% Solid, 50 lb boxes.....lb.	.08	.08½	.08½	.08
40.00	32.50	37.00	23.50	J1 bags.....ton	.....	41 00	43 00	40.00
40.00	32.50	37.00	30.00	J 2 bags.....ton	.....	29 00	40 00	29.00
				R 2 bags.....ton	.....	29.00	34.00	29.00
.18	.18	.21	.18	Naphtha, v. m. & p. (deodorized)				
				bbls.....gal.	.....	.16	.18	.16
.06	.05½	.06	.05½	Naphthalene balls, 250 lb bbls				
.04½	.04½	.04½	.04½	wks.....lb.	.....	.05½	.05½	.05½
.05	.05	.05	.04½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.24	.21	.21	.21	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.38	.35	.35	.35	Nickel Chloride, bbls kegs....lb.	.21	.24	.24	.21
.09½	.09	.09	.08½	Oxide, 100 lb kegs NY.....lb.	.37	.40	.40	.37
.09	.08½	.08½	.08	Salt bbl. 400 bbls lb NY...lb.	.....	.13	.13	.13
				Single, 400 lb bbls NY.....lb.	.....	.13	.13	.13
1.30	1.25	1.25	1.10	Nicotine, free 40%, 8 lb tins,				
1.20	.98½	1.10	1.10	cases.....lb.	1.25	1.30	1.30	1.25
14.00	13.00	13.00	13.00	Sulfate, 10 lb tins.....lb.	.98½	1 20	1.20	.98½
				Nitre Cake, bulk .....ton	14.50	18.00	18.00	12.00
.10½	.10½	10½	.09½	Nitrobenzene, redistilled, 1000				
				lb drs wks.....lb.	.10½	.10½	.10½	.10½
Nom.	.40	.40	.40	Nitrocellulose, regular drums				
				wks.....lb.	.40	Nom.	Nom.	.40
Nom.	.55	.55	.55	Low viscosity (soln only)				
Nom.	.50	.50	.50	Grade 1 drums, wks.....lb.	.55	Nom.	Nom.	.55
4.00	3.35	3.60	3.35	Grade 2 drums, wks.....lb.	.50	Nom.	Nom.	.50
.25	.25	.25	.25	Nitrogenous Material, bulk..unit	.....	3.55	4.00	3.55
.15	.14	.14	.14	Nitronaphthalene, 550 lb bbls lb.	.....	.25	.25	.25
Nom.	.25	.25	.25	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
.18	.17	.17	.17	Nutgalls Aleppy, bags.....lb.	.16	.16½	.16½	.16
.24	.22	.22	.22	Chinese, bags.....lb.	.12	.13	.13	.12
.03½	.03½	.03½	.03½	Powdered, bags.....lb.	.22	.24	.24	.22
.04½	.04	.04	.04	Oak, tanks, wks.....lb.	.....	.03½	.03½	.03½
50.00	45.00	45.00	45.00	23-25% liq., 600 lb bbl wk lb.	.04	.04½	.04½	.04
23.00	20.00	20.00	20.00	Oak Bark, ground.....ton	30.00	35.00	50.00	30.00
				Whole.....ton	20.00	23.00	23.00	20.00
.13½	.13	.14½	.13	Orange-Mineral, 1100 lb casks				
2.25	2.20	2.20	2.20	NY.....lb.	.12½	.13½	.13½	.12½
2.50	2.35	2.50	2.35	Orthoaminophenol, 50 lb kgs..lb.	2.20	2.25	2.25	2.20
.65	.50	.50	.50	Orthoanisidine, 100 lb drs....lb.	2.50	2.60	2.60	2.50
.28	.18	.18	.18	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
				Orthocresol, drums.....lb.	.18	.28	.28	.18
.07	.06	.06	.06	Orthodichlorobenzene, 1000 lb				
				drums.....lb.	.07	.10	.10	.07
.35	.32	.32	.32	Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	30	.33	.33	.30



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is noticeable in demand generally which continues very heavy. The market is very strong.

Soda Caustic — Producers on ash and caustic are entering the contract season for 1930, and the renewal to date has been reported about normal. There is no indication whatever of lower prices and all contracts are being made on the basis of 1929 prices. There have been but few disturbing influences noted in the market and the general attitude seems to be that business will be even better than in 1929 which was a banner year.

Sodium Cyanide — Imports of sodium cyanide during the first eight months of the current year were nearly 1,440 tons greater than for the same period of 1928. The total tonnage imported in the year 1928 was 18,788, valued at $2,930,136. Canada was the source of 73 per cent of the 1928 imports (13,749 tons), Germany 3,023 tons, and Great Britain 1,785 tons. The upward trend in imports of this chemical since 1925 and the steady but small export trade are shown by the following data: Imports 1925, 10,106 tons, $2,600,433; 1926, 15,902 tons, $2,557,900; 1927, 16,299 tons, $2,607,945; 1928, 18,788 tons, $2,930,136. Exports amounted to, 1925, 796 tons, $273,937; 1926, 941 tons, $305,398; 1927, 649 tons, $212,547; 1928, 789 tons, $243,046. Among the principal uses to which this increased consumption is partly due are the electroplating industry, heat treatment of metals and extraction of metals.

Sodium Nitrate — The market here has been without any developments of any kind, as the past month has been just as inactive as September. Spot and nearby has been dormant, with only an occasional unimportant sale of futures. A report from London says that the rectified stocks at 30th June, 1929, are advised at 938,000 ons against 670,000 tons at the same date last year. The Oficina consumpton and "Merma", i.e. (difference between book stocks and actual verified stocks), for the twelve months ending 30th June, 1929, thus amounted to 45,000 tons, making the effective production for the year about 3,182,000 tons. The "Merma" at the 30th June, 1928 only amounted to 1,000 tons.

The summary of the position as at 30th September is as follows:—

	1929	*1928*
Visible Supply:		
Europe and Egypt...	818,000	549,500 tons
United States.....	166,000	112,000 "
Japan & other Countries.....	23,000	29,000 "
Stocks in Chile.....	1,085,000	922,000 "
Total Supply in Sight at September 30th.....	2,092,000	1,612,500 tons

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Orthonitrotoluene, 1000 lb drs wk.....lb.	.17	.18	.18	.17
.18	.17	.13	.13	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.90	.85
.90	.85	.85	.85	Orthotoluidine, 350 lb bbl lc-l lb.	.25	30	.30	.25
.31	.29	.29	.25	Orthonitroparachlorphenol, tins .....lb.	.70	.75	.75	.70
.75	.70	.70	.70	Osage Orange, crystals.....lb.	.16	.17	.17	.16
.17	.16	.16	.16	51 deg. liquid.....lb.	.07	.07½	.07½	.07
.07	.07	.07	.07	Powdered, 100 lb bags.....lb.	.14½	.15	.15	.14½
.15	.14½	.14½	.14½	Paraffin, refd, 200 lb cs slabs				
.06¾	.06½	.06½	.06½	123-127 deg. M. P.....lb.	.06	.06½	.06¾	.06½
.07¼	.07¼	.07¼	.07¼	128-132 deg. M. P.....lb.	.06½	.06½	.07	.06½
.08¼	.08	.08	.08	133-137 deg. M. P.....lb	.07½	.07¾	.07¾	.07¼
.10	.08¾	.08¼	.08¾	138-140 deg. M. P.....lb.	.08	.09	.09	.08
.28	.20½	.29	.26	Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.28	.20½
1.05	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg..lb.	1.00	1.05	1.05	1.00
				Aminohydrochloride, 100 lb kegs.....lb.	1.25	1.30	1.30	1.25
1.30	1.25	1.25	1.25	Aminophenol, 100 lb kegs..lb.	.99	1.02	1.15	.99
1.15	1.15	1.15	1.15	Chlorophenol, drums.....lb.	.50	.65	.65	.50
.65	.50	.50	.50	Coumarone, 330 lb drums..lb.	.....	.....	.....	.....
.....	.....	.12	.12	Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.50	2.25
2.50	2.25	2.25	2.25	Dichlorobenzene, 150 lb bbls wks.....lb.	.17	.20	.20	.17
.20	.17	.17	.17	Nitroacetanilid, 300 lb bbls.lb.	.50	.55	.55	.50
.55	.50	.53	.50	Nitroaniline, 300 lb bbls wks .....lb.	.48	.59	.49	.48
.59	.48	.52	.52	Nitrochlorobenzene, 1200 lb drs wks.....lb.	.23	.26	.26	23
.32	.32	.32	.32	Nitro-orthotoluidine, 300 lb bbls.....lb.	2.75	2.85	2.85	2.75
2.85	2.75	2.75	2.75	Nitrophenol 185 lb bbls....lb.	.50	.55	.55	.50
.55	.50	.50	.50	Nitrosodimethylaniline, 120 lb. bbls.....lb.	.92	.94	.94	.92
.94	.92	.92	.92	Nitrotoluene, 350 lb bbls....lb.	.30	.31	.31	.30
.30	.30	.30	.25	Phenylenediamine, 350 lb bbls .....lb.	1.15	1.20	1.20	1.15
1.20	1.15	1.20	1.15	Toluenesulfonamide, 175 lb bbls.....lb.	.70	.75	.75	.70
.41	.40	.40	.40	Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.22	.20
.22	.20	.20	.18	Toluidine, 350 lb bbls wk...lb.	.40	.42	.42	.40
.42	.40	.45	.38	Paris Green, Arsenic Basis				
.25	.20	.21	.21	100 lb kegs.....lb.	.....	.27	.27	.25
.23	.17	.19	.19	250 lb kegs.....lb.	.....	.25	.25	.23
.....	.....	.25	.25	Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	.25
.03	.02½	.02½	.02½	Petrolatum, Green, 300 lb bbl.lb.	.02	.02½	.02½	.02
.13	.20	.18	.16	Phenol, 250-100 lb drums.....lb.	.14½	.15	.16	.13
1.35	1.3.	1.35	1.28	Phenyl - Alpha Naphthylamine, 100 lb kegs.....lb.	.....	1.35	1.35	1.35
				Phosphate				
				Phosphate Acid (see Superphosphate)				
				Phosphate Rock, f.o.b. mines				
3.15	3.00	3.00	3.00	Florida Pebble, 68% basis..ton	3.00	3.15	3.15	3.00
3.65	3.50	3.50	3.50	70% basis.....ton	3.75	4.00	4.00	3.50
4.15	4.00	4.00	3.85	72% basis.....ton	4.25	4.50	4.50	4.00
5.00	5.00	5.35	5.00	75-74% basis.....ton	5.25	5.50	5.50	5.00
5.75	5.75	5.75	5.60	75% basis.....ton	.....	5.75	5.75	5.75
6.25	6.25	6.25	6.00	77-76% basis.....ton	.....	6.25	6.25	6.25
5.00	5.00	5.50	5.00	Tennessee, 72% basis.....ton	.....	5.00	5.00	5.00
.40	.35	.35	.35	Phosphorous Oxychloride 175 lb cyl.....lb.	.20	.25	.40	.20
.65	.60	.65	.60	Red, 110 lb cases.....lb.	.37½	.42	.60	.37½
.32	.32	.32	.32	Yellow, 110 lb cases wks..lb.	.31	.37½	.32	.31
.46	.46	.46	.46	Sesquisulfide, 100 lb cs.....lb.	.....	.44	.46	.44
.....	.....	.35	.35	Trichloride, cylinders.....lb.	.20	.25	.35	.20
.20	.18	.18	.18	Phthalic Anhydride, 100 lb bbls wks.....lb.	.18	.20	.20	.18
45.00	37.00	40 00	37.00	Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	45.00	37.00
.64	.63	.63	.63	Pine Oil, 55 gal drums or bbls Destructive dist.....lb.	.63	.64	.64	.63
10.60	8.00	8.00	8.00	Prime bbls.....bbl.	8.00	10.60	10.60	8.00
.70	.70	.70	.66	Steam dist. bbls.....gal.	.65	.70	.70	.65
45.00	40.00	40.00	40.00	Pitch Hardwood, wks.....ton	40.00	45.00	45.00	40.00
3.30	3.30	3.30	3.30	Plaster Paris, tech, 250 lb bbls .....bbl.	3.30	3.50	3.50	3.30
				Potash				
.07½	.07½	.07½	.07½	Potash, Caustic, wks, solid...lb.	.06½	.06¾	.07½	.06½
.07½	.07½	.07½	.07½	flake.....lb.	.0705	.08	.07½	.0705
9.00	9.00	9.00	9.00	Potash Salts, Rough Kainit 12.4% basis bulk.....ton	.....	9.10	9.10	9.00
9.50	9.50	9.50	9.50	14% basis.....ton	.....	9.60	9.60	9.50
12.40	12.40	12.40	12.40	Manure Salts 20% basis bulk.....ton	.....	12.50	12.50	12.40
18.75	18.75	18.75	18.75	30% basis bulk.....ton	.....	18.95	18.95	18.75
36.40	36.40	36.40	36.40	Potassium Muriate, 80% basis bags.....ton	.....	36.75	36.75	36.40
27.00	27.00	27.00	27.00	Pot. & Mag. Sulfate, 48% basis bags.....ton	.....	27.50	27.50	27.00
47.30	47.30	47.30	47.30	Potassium Sulfate, 90% basis bags.....ton	.....	47.75	47.75	47.30
.09½	.09	.09	.09	Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.1?	.14	.14	.13
.09½	.08½	.08½	.08	Bichromate Crystals, 725 lb casks.....lb.	.09	.09½	.09½	.09
.12½	.12	.12	.11	Powd., 725 lb cks wks....lb.	.13	.13½	.13½	.13

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Freights have declined slightly, owing to continued weakness in the Plate and at the close, prompt and nearby loading steamers could be chartered at something under quoted rates, but for forward loadings, owners show no interest to operate at present.

Sodium Silicate — There have been no imports reported for the first six months of 1929. This is probably due to increased domestic production. Imports statistics for the past eight years are as follows: 1919, 466 tons, $25,421; 1922, 382 tons, $18,517; 1923, 302 tons, $12,182; 1924, 215 tons, $8,229; 1925, 118 tons, $6,781; 1926, 97 tons, $3,893; 1927, 77 tons, $3,068; 1928, 75 tons, $3,187.

On the other hand, exports have increased as shown by the following figures: 1919, 14,565 tons, $302,161; 1922, 16,551 tons, $316,543; 1923, 16,352 tons, $301, 571; 1924, 20,258 tons, $353,944; 1925, 24,172 tons, $396,496; 1926, 27,493 tons, $432,062; 1927, 29,653 tons, $641,907; 1928, 16,844 tons, $310,876.

Sodium Sulfide — An unexpected weakness developed in the market during the past month, despite the fact that some quarters report most producers to be sold up. Nevertheless, some considerable supplies have been available during the past month leading to lower price quotations. The growth in domestic production of sodium sulfide from 24,682 tons in 1921 to 46,494 tons in 1927 has enabled the American chemical industry to supply 90 per cent of domestic requirements of this commodity, says the Department of Commerce. The remainder is supplied by imports, which averaged about 4,500 tons in 1927-28. The increased consumption corresponding to the above figures is attributable to greater activities in the chief consuming industries for this commodity, including manufacture and application of sulfur colors, tanning, maining and rayon. Since sodium sulfide is made from sulfates, chiefly of barium and sodium, the important changes which are affecting the availability of these salts on the American market must be considered in understanding the economics pertaining thereto. Among these are the establishment and growth of the American barium chemical industry, of which sodium sulfide is a co-product, the synthetic nitrogen and hydrochloric acid industries which tend to make the by-product niter cake unnecessary.

Tankage — Has been scarce and in good demand, which combination of circumstances has resulted in higher prices with New York quoted at $4.50 & 10 per unit. Stocks are very light and it is

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.17	.16	.16	.16	Binoxiate, 300 lb bbls.....lb.	.16	.17	.17	.16
.30	.30	.30	.30	Bisulfate, 100 lb kegs.....lb.	.....	.30	.30	.30
.05½	.05½	.05½	.05½	Carbonate, 80-85% calc. 800 lb casks.....lb.	.05½	.05½	.05½	.05½
.09	.06½	.08½	.08½	Chlorate crystals, powder 112 lb keg wks .....lb.	.08½	.09	.09	.08½
.08½	.07½	.08½	.08½	Imported 112 lb kegs NY.....lb...	.07½	.07½	.07½	.07½
.05½	.05½	.05½	.05½	Chloride, crys bbls.....lb.	.05½	.05½	.05½	.05½
.28	.27	.27	.27	Chromate, kegs .....lb.	.27	.28	.28	.27
.57½	.55	.55	.55	Cyanide, 110 lb. cases....lb.	.55	.57½	.57½	.55
.12	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl...lb.	.12	.13	.13	.11½
.17	.16	.16	.16	Oxalate, bbls .....lb.	.20	.24	.24	.16
.12	.11	.11	.11	Perchlorate, casks wks lb.	.11	.12	.12	.11
.15½	.15	15½	.14½	Permanganate, USP, crys 500 & 100 lb drs wks .....lb.	.16	.16½	.16½	.16
.38	.37	.39	.37½	Prussiate, red, 112 lb keg...lb.	.38	.40	.40	.38
.18½	.18	.18	.18	Yellow, 500 lb casks.....lb.	.18½	.21	.21	.18½
.51	.51	.51	.51	Tartrate Neut, 100 lb keg..lb.	.....	.21	.51	.51
.25	.25	.25	.25	Titanium Oxalate, 200 lb bbls .....lb.	.21	.23	.25	.21
.. ..	.....	.....	.....	Propyl Furoate, 1 lb tins.....lb.	.....	5.00	5.00	5.00
.05	.04	.04	.04	Pumice Stone, lump bags.....lb.	.04	.05	.05	.04
.06	.04½	.04½	.04½	250 lb bbls.....lb.	.04½	.06	.06	.04½
.03	.02½	02½	.02½	Powdered, 350 lb bags.....lb.	.02½	.03	.03	.02½
.03½	.03½	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03½	.03½	.03½
.05½	.05½	5.50	5.50	Linseed Oil, kegs.....100 lb.	.....	.05½	.05½	.05½
1.50	1.50	3.00	1.50	Pyridine, 50 gal drums.....gal.	.....	1.75	1.75	1.50
.13	.13	.13	.12	Pyrites, Spanish cif Atlantic ports bulk.....unit	.13	.13½	.13½	.13
.04	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03½	.04	.04	.03½
.04	.03½	.03½	.03½	450 lb bbls c-l.....lb.	.03½	.04½	.04½	.03½
.05	.04	.04	.04	35% Bleaching, 450 lb bbl .lb.	.04½	.05½	.04½	.05½
.05	.05	.05	.04½	Solid, 63%, 100 lb bales cif..lb.	.05	.05½	.05½	.05½
.05	.05	.05	.05	Clarified, 64%, bales.....lb.	.....	.5½	.05½	.05½
.06	.05½	.06½	.06½	Quercitron, 51 deg liquid 450 lb bbls.....lb.	.05½	.06	.06	.05½
.13	.10	.10	.10	Solid, 100 lb boxes.....lb.	.10	.13	.13	.10
14.00	14.00	14.00	14.00	Bark, Rough.....ton	.....	14.00	14.00	14.00
35.00	34.00	34.00	34.00	Ground.....ton	34.00	35.00	35.00	34.00
.46	.45	.45	.45	R Salt, 250 lb bbls wks.....lb.	.45	.46	.46	.45
.....	.....	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.18	.18	.18
1.35	1.25	1.25	1.25	Resorcinol Tech, cans.....lb.	1.15	1.25	1.25	1.15
.57	.57	.67	.57	Rosin Oil, 50 gal bbls, first run .....gal.	.....	.62	.62	.57
.62	.62	72	.62	Second run.....gal.	.....	.64	.64	.62

Rosin

				Rosins 600 lb bbls 280 lb...unit				
9.75	8.20	13.00	8.50	B.....	.....	9.25	9.25	7.45
9.80	8.25	13.00	8.50	D.....	.....	9.25	9.25	7.70
9.95	8.60	13.15	8.50	E.....	.....	9.27	9.27	8.30
10.10	8.65	13.20	8.50	F.....	.....	9.27	9.27	8.40
10.10	8.75	13.25	8.50	G.....	.....	9.30	9.45	8.40
10.10	8.75	13.30	8.50	H.....	.....	9.30	9.50	8.40
10.15	8.80	13.35	8.55	I.....	.....	9.30	9.50	8.40
10.15	8.85	14.80	8.65	K.....	.....	9.32	9.55	8.45
10.30	8.85	15.00	8.80	M.....	.....	9.32	9.85	8.50
11.00	9.15	15.85	9.15	N.....	.....	9.45	10.30	8.93
11.65	10.15	16.60	10.50	WG.....	.....	9.50	11.30	9.00
12.65	10.40	18.55	12.00	WW.....	.....	9.95	12.30	9.30
30.00	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00	24.00
.08	.07	.07	.07	Lump, imported, bbls.....lb.	.07	.08	.08	.07
.12	.09	.09	.09	Selected bbls.....lb.	.09	.12	.12	.09
.05	.02	.02	.02	Powdered, bbls.....lb.	.02	.05	.05	.02
.05	.04½	.04½	.04½	Sago Flour, 150 lb bags.....lb.	.04½	.05	.05	.04½
.....	.....	.90	.90	Sal Soda, bbls wks.....100 lb.	.....	1.00	1.00	1.00
20.00	19.00	19.00	19.00	Salt Cake, 94-96% c-l wks. .ton	19.00	21.00	21.00	19.00
17.00	15.00	15.00	15.00	Chrome .....ton	12.00	15.00	17.00	12.00
.06½	.06½	.06½	.06½	Saltpetre, double refd granular 450-500 lb bbls.....lb.	.06½	.06½	.06½	.06½
.01½	.01½	.01½	.01½	Satin, White, 500 lb bbls.....lb	.....	.01½	.01½	.01½
.62½	.49	.66	.47	Shellac Bone dry bbls.....lb.	.....	.54	.61	.54
.55	.45	.57	.41	Garnet, bags.....lb.	.. ..	.45	.45	.43
.58	.47	.65	40	Superfine, bags.....lb.	.....	.46	.47	.45
.55	.42	.37	.57	T. N. bags.....lb.	.....	.42	.44	.41
.57	.53	.50	.50	Schaeffer's Salt, kegs.....lb.	.53	.57	.57	.53
11.00	8.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00	8.00
30.00	22.00	15.00	15.00	Refined, floated bags.....ton	22.00	30.00	30.00	22.00
.....	.....	32.00	32.00	Air floated bags.....ton	.....	32.00	32.00	32.00
40.00	32.00	55.00	55.00	Extra floated bags.....ton	32.00	40.00	40.00	32.00
22.00	15.00	15.00	15.00	Soapstone, Powdered, bags f. o. b. mines.....ton	15.00	22.00	22.00	15.00

Soda

				Soda Ash, 58% dense, bags c-l				
1.40	1.40	1.32½	1.32½	wks.....100 lb.	.....	1.40	1.40	1.40
2.29	2.40	2.14	2.04	58% light, bags.....100 lb.	.....	1.34½	1.34½	1.34½
1.32½	1.32½	1.32½	1.32½	Contract, bags c-l wks.100 lb.	.....	1.32	1.32	1.32
				Soda Caustic, 76% grnd & flake				
4.21	4.16	4.16	4.06	drums.....100 lb.	.....	3.35	3.35	3.35
3.91	3.76	3.76	3.66	76% solid drs.....100 lb.	.....	2.95	2.95	2.95
3.00	3.00	3.00	3.00	Contract, c-l wks.....100 lb.	.....	2.90	2.90	2.90
				Sodium Acetate, tech....450 lb.				
.05	.04½	.04½	.04½	bbls wks.....lb.	.05	.06	.06½	.05
.....	.....	.19	.18	Arsenate, drums.....lb.	.18	.19	.19	.18
.....	.....	1.00	1.00	Arsenite, drums.....gal.	1.00	1.50	1.50	1.00
2.41	2.41	2.41	2.41	Bicarb, 400 lb bbl NY..100 lb.	.....	2.41	2.41	2.41

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Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

expected that prices will continue to go higher.

Tapioca Flour — After remaining steady for several years, this material has now started a strong price advance. The Java crop is reported as being very short and in addition a shortage of the rice crop has forced the natives to eat tapioca, with the result that the original shortage is accentuated. High grade is now at 5¼c @ 5¾c lb. while medium grade is at 4½c @ 4¾c lb. in a strong market.

Turpentine — Despite an apparent increase in interest, the prices have shown no recovery during the past month and remain at about the same level as when last quoted. World production during the past three seasons is estimated as follows:

Barrels	*1926-27*	*1927-28*	*1928-29*
United States	510,000	650,000	560,000
France	195,000	165,000	180,000
Spain	52,000	58,000	56,000
Portugal	15,000	15,000	13,500
Greece	17,000	15,000	17,500
Mexico	15,000	20,000	17,000
India	7,000	9,500	10,500
Other countries	10,000	10,000	10,000
Totals	821,000	942,500	864,500

OILS AND FATS

Chinawood Oil — Prices in China are rising so rapidly and the conditions in that country are such that it is believed that a steadily rising market has definitely set in. A contributing influence is the fact that linseed oil seems also to be definitely high-priced for some time to come. Shipments of wood oil from Hankow for September were 8,398,000 pounds, the United States receiving 6,638,000 pounds and Europe 1,760,000 pounds. Estimated unsold stocks at Hankow at the end of the month were approximately 1,400 short tons. Shipments to this country during September only amounted to only 6,638,000 pounds as compared with 14,448,000 pounds in August and 11,568,000 pounds in September 1928. However the total quantity imported for the first nine months of 1929 amounted to 85,939,625 pounds as compared with 79,606,835 pounds for the corresponding period of 1928. Various experiments connected with the growth of the tung tree on the Pacific Coast seem to indciate that production in those states may be quite possible.

Cottonseed Oil — The past month has been rather a steady one in this market and but little change in prices has been noted. The crushing report was much larger than last year and crude oil entered the market at 7⅛c lb. Cottonseed crushed during the two months ended

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.07	.06½	.06½	.06½	Bichromate, 500 lb cks wks..lb.	.07½	.07½	.07½
.04	.04	.08½	.08½	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04
1.35	1.30	1.30	1.30	Carb. 350 lb bbls NY..100 lb.	1.30	1.35	1.35
.06½	.05½	.06½	06½	Chlorate, ... wks..lb.	.07½	.08	.11
13.00	12.00	12.00	12.00	Chloride, technical.....ton	12.00	13.00	13.00
.20	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.18	.20	.20
.09	.08½	.08½	.08½	Fluoride, 300 lb bbls wks...lb.	.08½	.09	.09
.24	.22	.22	.22	Hydrosulfite, 200 lb bbls f. o. b. wks.....lb.	.22	.24	.24
.05	.05	.05	.05	Hypochloride solution, 100 lb cbys.....lb.	.....	.05	.05
3.05	2.65	2.65	2.65	Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.65	3.05	3.05
2.65	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.65
.45	.45	.70	.45	Metanilate, 150 lb bbls.... lb.	.....	.45	.45
.....	.....	.02½	.02½	Monohydrate, bbls.....lb.	.....	.02½	.02½
.57	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.55	.57	.57
2.45	2.12½	2.67	2.25	Nitrate, 92%, crude, 200 lb bags c-1 NY.....100 lb.	2.11	2.13½	2.22½
.08½	.07½	.08½	.08	Nitrite, 500 lb bbls spot....lb.	.07½	.08	.08
.27	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.27
.23	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.37	.42	.42
3.90	3.90	3.90	3.90	Paratoluene, tri-sodium, tech. 100 lb bbls c-1....100 lb.	.....	3.90	3.90
.09	.08	.08	.08	Sulfonate, 175 lb bbls....lb.	.08	.09	.09
.22	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.18	.20	.22
3.55	3.25	3.25	3.25	Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	3.25	3.55	3.55
.....	.....	.....	.....	tri-sodium, tech, 325 lb bbls.....100 lb.	3.90	4.00	4.00
.72	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72
.12½	.12	.12	.11	Prussiate, Yellow, 350 lb bbl wks.....lb.	.12	.12½	.12½
.14	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.15	.20	.20
1.45	1.20	1.20	1.20	Silicate, 60 deg 55 gal drs, wks .....100 lb.	.....	1.65	1.65
1.10	.85	.85	.85	40 deg 55 gal drs, wks .....100 lb.	.70	.80	.80
.05	.05	.04½	.04½	Silicofluoride, 450 lb bbls NY .....lb.	.05½	.05½	.05½
.49	.48½	.48½	.48½	Stannate, 100 lb drums....lb.	.41½	.42	.43
.29	.18	.20	.20	Stearate, bbls.....lb.	.25	29	.29
.18	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18
.02½	.02½	.02½	.02½	Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02½	.02½	.02½
.02½	.02½	.02½	.02½	Sulfide, 30% crystals, 440 lb bbls wks.....lb.	.02½	.02½	.02½
.04	.03½	.03½	03½	62% solid, 650 lb drums 1c-1 wks.....lb	.03	.03½	.04
.03½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks.....lb.	.03½	.03½	.03½
.50	.40	.40	.40	Sulfocyanide, bbls.....lb.	.28	.35	.76
.85	.80	.85	.80	Tungstate, tech, crystals, kegs .....lb.	.....	.88	1.40
.40	.35	.40	.35	Solvent Naphtha, 110 gal drs wks.....gal.	.35	.40	.40
.01½	.01½	.01½	.01½	Spruce, 25% liquid, bbls.....lb.	.....	.01½	.01½
.01	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01
.02½	.02	.02	.02	50% powd, 100 lb bag wks lb.	.02	.02½	.02½
4.42	3.07	3.22	3.07	Starch, powd., 140 lb bags .....100 lb.	3.92	4.12	4.12
4.32	2.97	3.12	2.97	Pearl, 140 lb bags.....100 lb.	3.82	4.02	4.02
.06½	.05½	.06	.04½	Potato, 200 lb bags.....lb.	.05½	.06½	.06½
.06½	.05½	.06½	.06½	Imported bags.....lb.	.05½	.06½	.06½
.08½	.08	.08	.06	Soluble.....lb.	.08	.08½	.08½
.10	.09½	.09½	.09	Rice, 200 lb bbls.....lb.	.09½	.10	.10
.07	.06½	.06½	.06½	Wheat, thick bags.....lb.	.06½	.07	.07
.10	.09½	.09½	.09½	Thin bags.....lb.	.09½	.10	.10
.07½	.07½	.07½	.07½	Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½
.09	.08½	.08½	.08	Nitrate, 600 lb bbls NY....lb.	.09	.09½	.09½
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25

Sulfur

2.05	2.05	2.05	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05
19.00	18.00	18.00	18.00	Crude, f. o. b. mines.....ton	18.00	19.00	19.00
2.40	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	2.40
2.50	2.50	2.50	2.50	Heavy bags c-1.....100 lb.	.....	2.50	2.50
3.45	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.	.....	3.45	3.45
2.85	2.65	2.65	2.65	Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.85
.05½	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05½
.04½	.03½	.03½	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½
.08½	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.08	.08½	.08½
.19	.17	.17	.17	Extra, dry, 100 lb cyl.....lb.	.17	.19	.19
.65	.10	.65	.65	Sulfuryl Chloride, 600 lb dr...lb.	.10	.65	.65
.11½	.11	.11	.11	Stainless, 600 lb bbls....lb.	.11	.11½	.11½
.06	.05½	.05	.05	Extract, 450 lb bbls.....lb.	.05½	.06	.06
130.00	130.00	130.00	130.00	Sicily Leaves, 100 lb bg...ton	.....	130.00	130.00
72.00	72.00	80.00	72.00	Ground shipment.....ton	.....	72.00	72.00
60.00	55.00	55.00	55.00	Virginia, 150 lb bags.....ton	55.00	60.00	60.00
15.00	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	15.00
18.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00
35.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	20.00	25.00	25.00
45.00	38.00	38.00	38.00	Refined, white, bags....ton	38.00	45.00	45.00
50.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00
55.00	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00
				Superphosphate, 16% bulk, wks.....ton	.....	9.50	10.00

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Oct. 1929 $1.058

with September 30 totaled 610,715 tons, against 495,478 tons for the same period last year, according to figures compiled by the United States Census Bureau. Receipts at mills during the period amounted to 1,159,856 tons, against 1,041,334 tons a year ago, and stocks on hand September 30 totaled 590,747 tons, against 567,820 tons on the same date in 1928. Output of cottonseed products during the two months included 184,841,061 pounds of crude oil, against 147,701,004 pounds in the corresponding period a year ago, 107,234,217 pounds of refined oil, against 82,648,468 pounds. August exports of cottonseed products included 463,864 pounds of crude oil, against 402,216 pounds in the same month last year; 613,930 pounds of refined oil, against 894,022 pounds.

Linseed Oil — It seems to have become quite generally accepted by this time that linseed oil prices are up to stay for some time to come. But up to the present time there has been but little indication to buy for futures although considerable business is being done for nearby shipment. Exports of flaxseed from the chief exporting countries—Argentina, India and Canada —during the United States season ended Aug. 31, 1929, were about equal to or slightly below those of the 1927-28 season, according to combined official and trade figures now available. Exports from Argetnina during this period were approximately 76,504,000 bushels compared with 75,786,000 bushels in 1927-28 but Canada and India both shipped smaller quantities than in the previous season, Shipments from Canada were 740,000 bushels below those of Sept. 1 to Aug. 31, 1927-28, while India reports a decrease of about 115,000 bushels for the same period. Imports into the United Stages showed a further decline during August. The 1,020.197 bushels imported for the month were below the July imports of this year and also below the imports in August, 1928. The total United States imports for the 1928-29 season ended Aug. 31, were 23,198,000 bushels and although this total is 5,038,000 bushels above the 1927-28 imports, the difference is not sufficient to balance the decrease of 7,157,000 bushels in the United States flaxseed crop for 1928 compared with that of 1927. The outlook for supplies of flaxseed for the 1929-30 season has improved slightly since the report of Sept. 19, according to information received in the foreign service by the Bureau of Agricultural Economics. This improvement is due to the heavy rains reported in Argentina which came about the third week of September and broke the serious drought which had con-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
5.10&10	4.65&10	4.85	4.00	Tankage Ground NY.....unit	..... 4.50&10	4.50&10	4.00&10
4.80&10	3.90&10	5.25	3.75	High grade f.o.b. Chicago.unit	..... 3.75&10	4.80&10	3.75&10
5.00&10	4.60&10	5.25	4.00	South American cif.....unit	..... 4.50&10	4.80&10	4.50&10
.05	.04½	.04½	.04½	Tapioca Flour, high grade bgs.lb.	.05½	.05½	.05½	.04½
.04	.03½	.03½	.03½	Medium grade, bags.....lb.	.04½	.04½	.04½	.03½
.27	.26	.26	.26	Tar Acid Oil, 15%,drums....gal.	.26	.27	.27	.26
.30	.29	.29	.29	25% drums.....gal.	.29	.30	.30	.29
.08	.07	.07	.07	Coke Oven, tanks wks.....lb.	.07	.08	.08	.07
13.50	13.50	16.00	13.50	Kiln Burnt, bbl.....bbl.	.....	13.50	13.50	13.50
15.00	13.50	18.50	13.50	Retort, bbls.....bbl.	13.50	15.00	15.00	13.50
1.75	1.15	1.15	1.15	Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.75	1.15
2.00	1.50	1.50	1.50	No. 2 bags or bbls...100 lb.	1.50	2.00	2.00	1.50
.02½	.02	2.00	2.00	Imported bags.....100 lb.	.02	.02½	.02½	.02
.....	.....	.....	.....	Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09½	.09
.20	.20	.20	.20	Tetralene, 50 gal drs wks.....lb.	.....	.20	.20	.20
.24	.22	.22	.22	Thiocarbanilid, 170 lb bbl....lb.	.22	.24	.24	.22
.17½	.14½	.20½	.17½	Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.13½	.14½	.13½
.41½	.36½	.48	.41½	Crystals, 500 lb bbls wks...lb.	.33	.33½	.38	.33
.58	.48	.71½	.58	Metal Straits NY.....lb.	.....	.42	.48	.42
.75	53	.75	.70	Oxide, 300 lb bbls wks.....lb.	.....	.46	.56	.46
.35½	.30½	.48	.35½	Tetrachloride, 100 lb drs wks. .....lb.	.....	.27½	.30½	.27½
.40	.40	.40	.40	Titanium Dioxide 300 lb bbl..lb	.30	.50	.50	.24
.14	.13½	.13½	.13½	Pigment, bbls.....lb.	.08½	.09	.14	.08½
.45	40	.40	.40	Toluene, 110 gal drs.....gal.	.....	.45	.45	.45
.45	.35	.35	.35	8000 gal tank cars wks....gal.	.....	.40	.40	.40
.94	.90	.90	.90	Toluidine, 350 lb bbls.....lb.	.90	.94	.94	.90
.32	.31	.31	.31	Mixed, 900 lb drs wks.....lb.	.31	.32	.32	.31
.90	.85	.85	.85	Toner Lithol, red, bbls.....lb.	.90	.95	.95	.85
.80	.70	.75	.75	Para, red, bbls.....lb.	.....	.80	.80	.70
1.80	1.70	1.75	1.75	Toluidine.....lb.	1.50	1.55	1.55	1.50
3.90	3.60	3.60	3.60	Triacetin, 50 gal drs wks.....lb.	3.60	3.90	3.90	3.60
.....	.....	.....	.....	Trichlorethylene, 50 gal dr...lb.	.10	.10½		
.....	.....	.....	.....	Triethanolamine, 50 gal drs...lb.	.55	.60	.60	.55
.50	.36	.36	.36	Tricresyl Phosphate, drs.....lb.	.33	.45	.45	.33
.73	.69	.70	.69	Triphenyl guanidine.....lb.	.58	.60	.70	.58
.75	.70	.70	.70	Phosphate, drums.....lb.	.60	.70	.75	.60
3.00	2.50	2.50	2.50	Tripoli, 500 lb bbls.....100 lb.	1.75	2.00	2.00	1.75
.66½	.50½	.86	.53½	Turpentine Spirits, bbls.....gal.	.54½	.61	.65	.51½
.59	.46	.76	.46	Wood Steam dist. bbls....gal.	.....	.53	.57	.49
.20	.18	.18	.18	Urea, pure, 112 lb cases.....lb	.15	.17	.30	.15
				Fert. grade, bags c.i.f.....ton	.....	101.00	101.00	98.00
				c. i. f. S. points.....ton	.....	102.30	102.30	99.30
76.00	55.00	70.00	66.00	Valonia Beard, 42%, tannin bags.....ton	.....	45.00	55.00	45.00
55.00	58 00	49.50	39.00	Cups, 30-31% tannin.....ton	.....	32.00	35.00	31.00
64.00	45.00	68.00	43.00	Mixture, bark, bags.....ton	.....	35.00	43.00	35.00
2.10	1.75	1.95	1.55	Vermillion, English, kegs....lb..	2.00	2.05	2.05	2.00
.....	.....	.....	.....	Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	1.00	1.00
76.00	49.75	59.00	49.50	Wattle Bark, bags.....ton	46.50	47.25	49.75	43.50
.06½	.05½	.05½	.05½	Extract 55%, double bags ex-dock.....lb.	.....	.06½	.06½	.06½
1.25	1.25	1.25	1.25	Whiting, 200 lb bags, c-1 wks .....100 lb.	.....	1.25	1.25	1.25
13.00	13.00	13.00	13.00	Alba, bags c-1 NY.....ton	.....	13.00	13.00	13.00
1.35	1.35	1.35	1.35	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35	1.35

Zinc

.05½	5.85	.06½	.06½	Zinc Ammonium Chloride powd., 400 lb bbls.....100 lb.	5.25	5.75	5.75	5.25
.10	.09½	.09½	.09½	Carbonate Tech, bbls NY..lb.	.10½	.11	.11	.10½
.06	.06	.06	.06	Chloride Fused, 600 lb drs. wks.....lb.	.05½	.06	.06	.05½
.06½	.06½	.06½	.06½	Gran., 500 lb bbls wks.....lb.	.06½	.06½	.06½	.06½
3.00	3.00	3.00	3.00	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00	3.00
.41	.40	.40	.40	Cyanide, 100 lb drums.....lb.	.40	.41	.41	.40
				Dithiofuroate, 100 lb dr....lb.	.....	1.00	1.00	1.00
.09	.09	.09	.09	Dust, 500 lb bbls c-1 wks...lb.	.09½	11	.08½	.08½
6.40	6.07½	7.35	6.40	Metal, high grade slabs c-1 NY.....100 lb.	.....	6 45	6.45	6.45½
.07½	.07½	.07½	.07½	Oxide, American bags wks..lb.	.07½	.07½	.07½	.07
.12½	.10½	.10½	.10½	French, 300 lb bbls wks...lb.	.09½	.11½	.11½	.09½
.....	.....	.....	.....	Perborate, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Stearate, 50 lb bbls.....lb.	.25	.26	.26	.25
.03½	.03½	.03½	.03	Sulfate, 400 bbl wks.....lb.	.03	.03½	.03½	.03
.32	.30	.30	.30	Sulfide, 500 lb bbls.....lb.	.30	.32	.32	.30
.30	.29	.29	.29	Sulfocarbolate, 100 lb keg..lb.	.29	.30	.30	.29
.32	.32	.38	.32	Xylene, 10 deg tanks wks...gal.	.....	.33	.33	.33
.32	.30	.36	.30	Commercial, tanks wks...gal.	.30	.32	.32	.30
.38	.38	.35	.35	Xylidine, crude.....lb.	.....	.38	.38	.38
.03	.02½	.02½	.02½	Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.03	.02½
.50	.45	.45	.45	Pure kegs.....lb.	.45	.50	.50	.45
.10	.08	.08½	.08	Semi-refined kegs.....lb.	.08	.10	.10	.08

Oils and Fats

.14½	.13	.14	.13	Castor, No. 1, 400 lb bbls.....lb.	.13	.13½	.13½	.13
.14	.12½	.14	.12½	No. 3, 400 lb bbls.....lb.	.12½	.13	.13	.12½
.17	.14	.18	.17	Blown, 400 lb bbls.....lb.	.14	.15	.15	.14
.17	.14½	.31	.13½	China Wood, bbls spot NY...lb.	.....	.16	.16	.14½
.14½	.14½	.18	.12½	Tanks, spot NY.....lb.	....	.14½	.15	.13½
.14½	.12½	.....	.....	Coast, tanks, Nov.....lb.	.....	.14	.14½	.12½
.11½	.10½	.12	.12	Cocoanut, edible, bbls NY...lb.	.....	.10½	.10½	.10½
.10	.09½	.09½	.09	Ceylon, 375 lb bbls NY....lb.	.....	.08½	.09½	.07½
.09	.08½	.08½	.08	8000 gal tanks NY.....lb.	.07	.07½	.08½	.06½
.10½	.09½	.10½	.09½	Cochin, 375 lb bbls NY....lb.	.08½	.09½	.10	.09½
.09½	.08½	.10	.08½	Tanks NY.....lb.	.....	.08½	.09½	.08½
.10	.08½	.09½	.08½	Manila, bbls NY.....lb.	.....	.08½	.09½	.07½
.08½	.08	.08½	.08½	Tanks NY.....lb.	.07	.07½	.08½	.06½
.08½	.07½	.08½	.08	Tanks, Pacific Coast.....lb.	.06½	.07	.08	.06½

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1829 $1.047 - Oct. 1929 $1.058

tinued for several months. It is not known just how much permanent injury was caused by the drought but the crop is expected to receive material benefit from the recent rains. The area is below that of last year. Prospects in the Northern Hemisphere remain poor although a slight improvement was shown in the Oct. 1 condition of the United States crop which is now estimated at 16,599,000 bushels compared with 18,690,000 bushels last year. Commercial stocks in the United States and Canada on Oct. 5 were slightly above those at the same time last year. Stocks reported for the United States were 913,000 bushels as compared with 1,038,000 bushels in 1928. Stocks in store in the western grain inspection division of Canada were 695,000 bushels compared with 445,000 bushels last year. Exports from Aug. 15 to Sept. 28 are placed by the trade at about 5,500,000 bushels, leaving a surplus of approximately 10,400,000 bushels on Sept. 28,1929. Flaxseed shipments from Argentina have declined considerably in recent months, accordnig to trade estimates, and total shipments for the current Argentine season, Jan. 1 to Sept. 28, are below those of last year. Shipments from India during the present India export season beginning Apr. 1 remain well above those of the previous season.

Palm Oil — This market has been fairly routine during the month with prices holding quite steady. Prevailing low prices during this year and some fear that a higher duty would be placed upon this oil have accounted for the increase in imports of this commodity which rose from $5,707,271 in the first seven months of 1928 to $10,213,781 in the same period of 1929, a gain of 78 per cent.

Soy Bean Oil — Increasing scarcity of the domestic material has driven the price higher so that quotations are now at 10½c lb. at the mills. Imported oil is on a parity, being quoted at this price at the Coast. However, the new crop of domestic oil should be available within a short time, bringing with it lower prices to the exclusion of the imported material.

Stearic Acid — Trade in this material has been consistently good during the past month which witnessed an increase in price of ¼c lb. on all grades.

Tallow — The net result of the past month has been a ¼c lb. lower price on exrta tallow, although at one time it was sufficiently high to encourage the increase in prices of stearic acid.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cod, Newfoundland, 50 gal bbls			
.69	.63	.66	.63	.....gal.	.....	.58	.64	.58
.63	.60	.59	.59	Tanks NY.....lb.	.....	.60	.60	.60
				Cod Liver see Chemicals.....			
.06½	.05½	.06	.06	Copra, bags.....lb.	.....	.045	.05½	.042
.11	.10	.11	.07	Corn, crude, bbls NY.....lb.	.....	.09¾	.10¾	.09½
.10	.08¾	.09¾	.07	Tanks, mills.....lb.	.....	.08	.09¾	.07½
.12½	.11¼	.14	.10½	Refined, 375 lb bbls NY....lb.	.....	.10½	.11¼	.10½
.11½	.10½	.12	.11	Tanks.....lb.	.....	.09½	.11	.09
.09½	.07½	.09½	.06½	Cottonseed, crude, mill.....lb.	.....	.07½	.09	.08½
10.65	.09½	.11¼	.08 1/5	PSY 100 lb bbls spot.....lb.	.....	.093	.1075	.092
10.75	.09½	.....	.....	Nov.—Jan.....lb.	.....	.092	.1080	.093
				Degras, American, 50 gal bbls			
.05	.04½	.04½	.04½	NY.....lb.	.04½	.05	.05	.04½
.05½	.04½	.04½	do	English, brown, bbls NY....lb.	.....	.05½	.05½	.05½
.05½	.05½	.05½	.05½	Light, bbls NY .....lb.	.....	.05½	.05½	.05½
				Greases			
.08½	.07	.07½	.06	Greases, Brown.....lb.	.....	.06½	.08½	.06
.08½	.07	.08	.06½	Yellow.....lb.	.....	.07½	.08½	.06½
.11	.09½	.10½	.08½	White, choice bbls NY.....lb.	.....	.08½	.11½	.07½
.42½	.40	.....	.....	Herring, Coast, Tanks.....gal.	.....	Nom.		
Nom.	.09½	.09½	.09	Horse, bbls.....lb.	.09½	Nom.	Nom.	.....
.16½	.15½	.16½	.14½	Lard Oil, edible, prime.....lb.	.....	.15½	.15½	.14½
.13½	.12	.13½	.10½	Extra, bbls.....lb.	.....	.12½	.13½	.12
.13	.11	.12½	.10½	Extra No. 1, bbls.....lb.	.....	.12	.13½	.11½
10.8	10.0	.11 4/5	.10 2/5	Linseed, Raw, five bbl lots...lb.	.....	.159	.162	.105
10.4	9.6	.11 9/10	.09 6/10	Bbls c-l spot.....lb.	.....	.155	.158	.101
9.6	8.8	.10½	.09	Tanks.....lb.	.....	.147	.15	.093
.09½	.09½	.09½	.09½	Lumbang, Coast.....lb.	.....	.09½	.09½	.09½
.48	.40	.47½	.44	Menhaden Tanks, Baltimore.gal.	.....	.50	.52	.45
.09	.09	.90	.10	Blown, bbls NY.....lb.	.....	.09	.09	.09
.70	.67	.70	.67	Extra, bleached, bbls NY..gal.	.....	.70	.70	.70
.64	.63	.66	.63	Ligh, pressed, bbls NY....gal.	.63	.64	.64	.63
.67	.66	.66	.69	Yellow, pressed, bbls NY..gal.	.66	67	.67	.66
				Mineral Oil, white, 50 gal bbls			
.60	.40	.....	.....	.....gal.	.40	.60	.60	.40
1.00	.95	.....	.....	Russian, gal.....gal.	.95	1.00	1.00	.95
.19	.18½	.18½	.14½	Neatsfoot, CT, 20° bbls NY lb.	.....	.18½	.19	.18½
.13½	.12	.13½	.10½	Extra, bbls NY.....lb	.....	.12½	.13½	.12
.16½	.15½	.16½	.12½	Pure, bbls NY.....lb.	.....	.14½	.15½	.13½
.17½	.11½	.18½	.10	Oleo, No. 1, bbls NY.....lb.	.....	.11½	.11½	.10½
.15½	.11	.17	.08½	No. 2, bbls NY.....lb	.....	.10½	.11½	.10
.14	.10	.14	.08½	No. 3, bbls NY.....lb.	.....	.10	.10½	.09½
1.40	1.18	1.75	1.40	Olive, denatured, bbls NY...gal.	1.05	1.15	1.40	1.05
2.00	1.75	2.00	2.45	Edible, bbls NY.....gal.	1.95	2.00	2.00	1.95
.11	.09½	.10½	.08½	Foots, bbls NY.....lb.	.09	.09½	.11½	.09
.09½	.08½	.09½	.09	Palm, Kernel, Casks.....lb.	.....	.08½	.09	.08
.09½	.07½	.08½	.07½	Lagos, 1500 lb casks.....lb.	.....	.07½	.09	.07½
.08½	.07	.08½	.07½	Niger, Casks.....lb.	.....	.07½	.08½	.07
.12½	.12	.14½	.12	Peanut, crude, bbls NY.....lb.	.....	Nom	Nom.	.....
.17	.14½	.15½	.14½	Refined, bbls NY.....lb.	.4½	15	.15	.14½
.21	.13	.16½	.12½	Perilla, bbls NY.....lb.	.....	.16½	.20	.15
.15½	.10½	.14½	.10	Tanks, Coast.....lb.	.....	.14	15½	.13½
1.75	1.70	1.70	1.70	Poppyseed, bbls NY.....gal.	1.70	1.75	1.75	1.70
1.06	1.01	1.05	1.00	Rapeseed, blown, bbls NY..gal.	1.04	1.04	1.04	1.04
.92	.83	.90	.82	English, drms. NY.....gal.	.....	.83	.90	.82
.90	.81	.85	.76	Japanese, drms. NY.....gal.	.....	.76	.88	.76
.10½	.09½	.10	.09	Red, Distilled, bbls.....lb.	.10½	.11½	.11½	.10½
.09½	.08	.09½	.08½	Tanks .....lb.	.....	.09½	10½	.09½
.5c	.42	.50	.50	Salmon, Coast, 8000 gal tks..gal.	.42	.44	.44	.42
.50	.41	.47	.43	Sardine, Pacific Coast tks...gal.	.....	.47	.51	.45
.13½	.12	.13	.11½	Sesame, edible, yellow, dos...lb.	.11½	.12	.12	.11½
.15	.12½	.14	.14	White, dos.....lb.	.12½	.12½	.12½	.12½
.40	.40½	.40	.40	Sod, bbls NY.....gal..	.....	.40	.40	.40
.....	.....	.09½	.09½	Soy Bean, crude.....				
.09½	.09	.....	.....	Pacific Coast, tanks.....lb.	.....	.10½	.10½	.09
				Domestic tanks, f.o.b. mills, ...lb.	.....	.10½	.10½	.08½
.12½	.12	.12½	.10½	Crude, bbls NY.....lb.	.....	.11½	.12½	.11¼
.10½	.10½	.11	.10½	Tanks NY.....lb.	.....	.11	.11½	.10½
.13½	.13½	.13	.12	Refined, bbls NY.....lb.	.13½	.13½	.13½	.13½
				Sperm, 38° CT, bleached, bbls				
.85	.84	.85	.84	NY.....gal.	.84	.85	.85	.84
.80	.79	.82	.79	45° CT, bleached, bbls NY gal.	.79	.80	.80	.79
				Stearic Acid, double pressed dist				
.18½	.11	.13½	.11½	bags.....lb.	.15½	.16½	.18½	.15½
				Double pressed saponified bags				
.19	.11½	.14	.11½	.....lb.	.16½	.16½	.19	.15½
.20½	.13½	.15½	.13½	Triple, pressed dist bags..lb	.18½	.18½	20½	.17½
.12½	.09½	.13	.08½	Stearine, Oleo, bbls.....lb.	.10½	.10½	.12	.09½
.09½	.08½	.09	.07½	Tallow City, extra loose.....lb.	.....	.08½	.08½	.07
.10½	.09½	.11	.08½	Edible, tierces.....lb.	.09	.09½	.10½	.08
.12½	.11½	.10½	.08½	Tallow Oil, Bbls, c-1 NY...lb.	.....	.11	.12	.10½
.11½	.10½	.12½	.10	Acidless tanks NY.....lb.	.....	.10	.11	.09½
Nom.	.08	.08½	.07½	Vegetable, Coast mats.....lb.	.08	Nom.	Nom.	.08
.11	.....	.11	.11	Turkey Red, single bbls.....lb.	.11	.12	.12	.11
.16	.14	.14	.14	Double, bbls.....lb.	.14	.16	.16	.14
				Whale, bleached winter, bbls				
.80	.78	.78	.78	NY.....gal.	.78	.80	.80	.78
.82	.80	.80	.80	Extra, bleached, bbls NY..gal.	.80	.82	.82	.80
.78	.76	.76	.76	Nat. winter, bbls NY.....gal.	.76	.78	.78	.76

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"WE"—Editorially Speaking

Esse E. Routh, who writes of the alkalis, is a very courteous, soft-spoken Southern gentleman. He was born and bred in the South and made it the scene of his business activities until last year when he went to New York to take charge of sales for Mathieson Alkali. He was educated at Virginia Polytechnic Institute and at Davidson College. He has spent his entire business career with Mathieson being successively assistant manager of bicarbonate sales, manager of bicarbonate sales, southern sales manager, and finally general sales manager.

The chemical industry is greatly indebted to Dr. Gustavus J. Esselen, Jr., for at last introducing some "sex appeal" into it. Although it comes at a time when the phrase is almost outworn, we cannot help but feel that this is an outstanding example of better late than never. Better had it been for s. a. never to have existed than never to have found its way into chemistry.

Dr. Esselen, author of this most interesting and novel discussion of rayon, "Chemical Clothing", was educated at Harvard University, being awarded his Ph. D. in 1912. Previous to 1921, he was successively research chemist, General Electric Co.; assistant manager and manager, Chemical Products Co., Boston; and member of the research staff of Arthur D. Little, Inc. Since 1921 he has been with Skinner, Sherman & Esselen, Inc., Boston, at present as vice-president and director. He is co-translator with C. J. West of "Textbook of Cellulose Chemistry" and the author of numerous technical papers. In 1926, he was John Howard Appleton lecturer at Brown University. He is a member of the Council of the American Chemical Society, the American Institute of Chemical Engineers, the American Association for the Advancement of Science, and executive member, Advisory Group, New England Research Consultants.

The late Robert C. Ingalls, whose article on "Chemical Fire Hazards" appears in these pages, was at the time of his death in September, president, Doe & Ingalls, Inc., Boston. He was born in Lynn, Mass., August 18, 1873, and began his business career with the Commonwealth Manufacturing Co., later the American Methyl Co., in 1898. In 1907 he became associated with Howe & French, Inc., remaining with them until 1921, when the firm of Doe & Ingalls was established.

COMING FEATURES

ALUMINUM CHLORIDE

Kenneth H. Klipstein discusses the past market history and present position of this much-discussed chemical in the light of recent developments.

CHEMICALS IN REFRIGERATION

Dr. J. B. Churchill presents a complete and thorough survey of the contributions of chemicals to the refrigeration industry.

DRY COLORS

James D. Todd surveys the past ten years' progress in the production of dry colors.

THE EDELEANU PROCESS

Robert L. Brandt describes this new application of liquid sulfur dioxide in the refining of petroleum distillates.

Thomas K. Urdahl has appeared in these pages before and is consequently known to readers of CHEMICAL MARKETS He is the author of numerous monographs and articles on economic subjects and has been a professor of economics since 1893. His own education was received at the University of Wisconsin, the University of Pennsylvania, and the University of Berlin, and he has taught in Colorado College, Washington and Lee University, University of Wisconsin, Swarthmore College, and Franklin & Marshall College, where he is now professor of political and social science. He was given leave by the University of Wisconsin in 1917-18 to serve as an examiner with the Federal Trade Commission, and in 1919 to serve as senior examiner, Emergency Fleet Corporation. He is a member of the American Economical Association, the American Academy of Political and Social Science, and Vereinigung fur Vergleichende Rechtswissenschaften.

J. D. Small, who writes on the new importance of solid carbon dioxide, is vice-president of the Dry Ice Corp. of America, which company has pioneered in the exploiting of this chemical under the trade-name of "Dry-Ice". He is a graduate of the U. S. Naval Academy, and served throughout the war as executive officer on a destroyer in French waters. Following the war, he took post-graduate work at Columbia University, receiving the degree of Master of Science. He was then appointed officer in charge of engineering and repair for submarine flotilla, Pacific Fleet, leaving there to enter the Naval Air Force as squadron commander. He finally resigned from the service to enter business, and is now officer and director in several other corporations in addition to his connection with the Dry Ice Corp. He is a member of the Engineers Club, Chemists Club of New York, Lieutenant-Commander, U. S. Naval Reserve, and Aide for Aviation, staff of Rear Admiral Franklin, N.Y.N.M.

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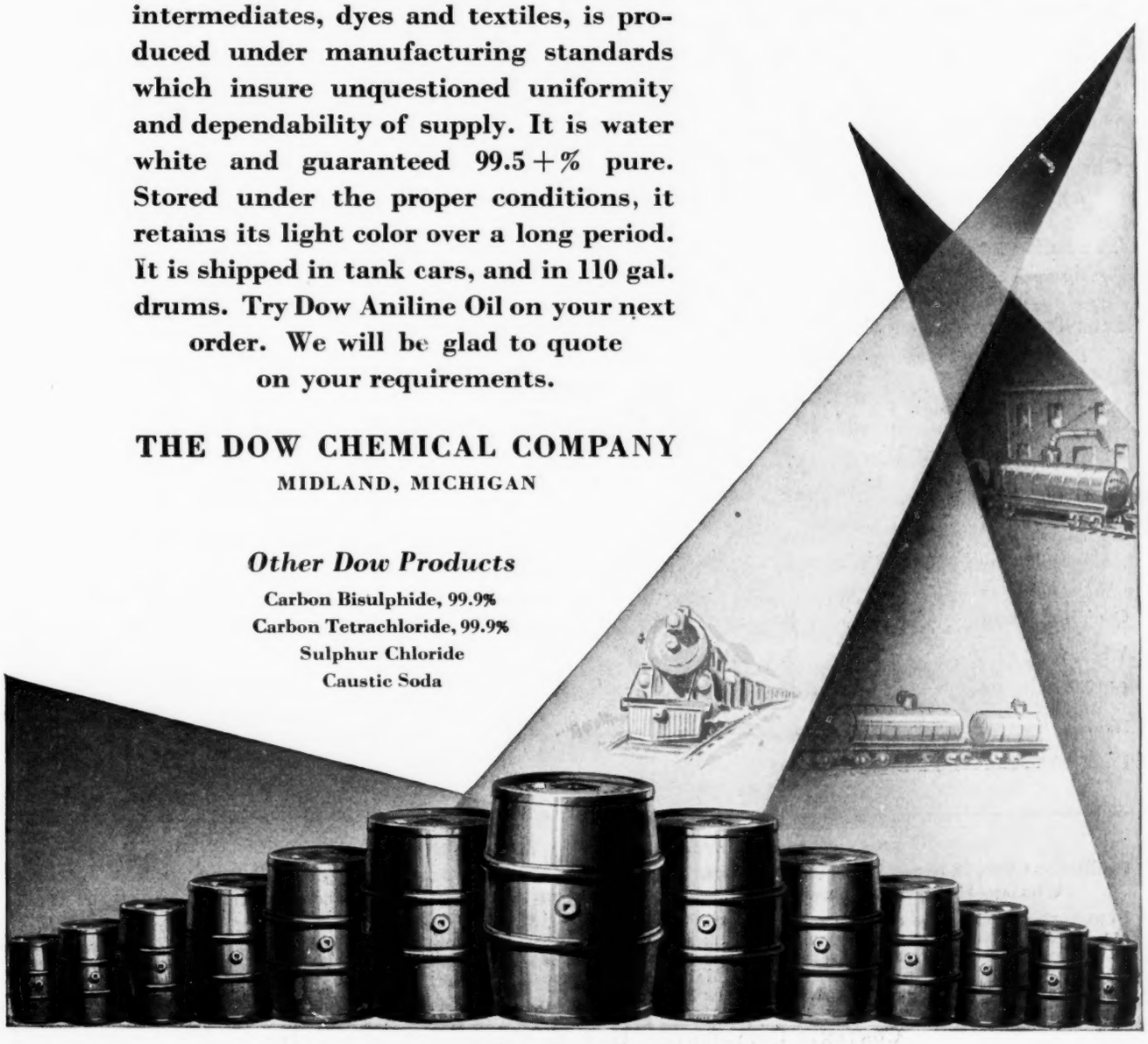
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